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MARCH 20, 1948

5,000,000 HP.
4,000,000 HP.
3,000,000 HP.
2,000,000 HP.
1,000,000 HP.
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5,000,000

GENERAL MOTORS DIESEL HORSEPOWER IN RAILROAD OPERATION

3,793 GENERAL MOTORS DIESEL LOCOMOTIVE UNITS — FEBRUARY 12, 1948

1935 1937 1939 1941 1943 1945 1947

RECORD GROWTH IN 1947

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ELECTRO-MOTIVE DIVISION

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Vol. 124 No. 12 March 20, 1948

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WEEK AT A GLANCE

WHAT KIND OF DOLLARS?: The relative adequacy of railroad earnings cannot be measured simply in terms of dollars, because it is the quantity of tools (materials, supplies and equipment, structures and betterments) those dollars will buy that determines their sufficiency. As our leading editorial emphasizes, it is not enough for a railroad's net to be as good as it was in the "prosperous" late Twenties, because a dollar now buys much less than it did then. The railroad's net must buy enough tools to maintain and improve its ability to give superior service, and these tools must be bought with today's dollars. The railroads' problem is to show the relationship between public self-interest and railroad profits adequate to meet this need.

ENGINEERS' GET-TOGETHER: Engineering and maintenance department officers of the railroads were in Chicago this week—or had their eyes turned in that direction if they could not leave their work—to get a round-up of the year's progress in their field. The committee reports and addresses and discussions of the American Railway Engineering Association were the medium for this consideration of accomplishments and problems, of new ideas and experiences and conclusions. The reports of 21 committees, dealing with 97 subjects, are summarized in this issue (beginning on page 69), as are many of the general addresses and technical papers that highlighted the convention's proceedings (page 64). Throughout these pages is evidence of recognition of the contributions which planned research is making to the still better coordinated and more efficient functioning of these departments.

UP TO THE BOARD: The case of the three obstreperous op unions for more wages plus more featherbed rules, and of the carriers for the rules changes they seek, is in the hands of the President's three-man "emergency board" as this issue goes to press. As our news pages report, the board has before it a record which includes the brothers' blunt warning that they will resort to what is euphemistically called a "defensive withdrawal from service in a body," if the board should approve, and the carriers should effect, any of the rules changes the railroads seek.

PER DIEM ARGUMENTS IN: Those railroads that want higher permanent per diem charges and those that want the commission to prescribe a lower per diem rate have submitted their arguments and evidence, as reported in one of this week's news stories.

PRICE REPORTS PROGRESS. While it may seem to onlookers that the railroads recently have been rushing head-over-heels after each other in their acceptance of Diesel-electric locomotives, their adoption of this type of motive power really is the result of 25 years of development and tests in which the railroads and many manufacturers in the railroad supply industry cooperated. This point was made this week in an address by Westinghouse Electric's President Price, an abstract of which appears on page 87 of this issue. And developments and tests are going on now with types of motive power that may prove to be practical and popular in the years to come, types employing electrical drives in connection with turbines propelled by steam or gas or coal, and others with gear drive. And research is going on just as intensively in the development of improvements and refinements of electrical equipment for passenger cars, says this authoritative spokesman.

AIR POLICY: The 92 recommendations of the special congressional study board considering the nation's air transportation policy are summarized in the news columns this week. No change is proposed in that section of the present law which the air industry regulators have interpreted to allow them to forbid the air lanes to those forms of transportation that are sullied by contact with the ground.

BULWINKLE BILL BOOKLET: An exchange of statements between President MacMillen of the Federation for Railway Progress and Vice-President Fort of the Association of American Railroads, growing out of the A.A.R's recent publication of a booklet circulated in support of the Bulwinkle bill, is reported in our news columns. The F. R. P. officer says there is some opposition to relieving the railroads from liability for anti-trust prosecution for making agreements, with Interstate Commerce Commission approval, under the terms of the proposed legislation. Mr. Fort quotes the House committee report that testimony for the bill was "virtually unanimous."

TO BUILD OR TO BUY?: One of our editorials discusses some of the factors that enter into consideration of a matter of future railroad policy of long-lasting consequence—that is, shall railroads that operate large fleets of Diesel-electric locomotives depend for parts supply on the builders and manufacturers recommended by them, or shall these railroads provide their own manufacturing and repair facilities to produce the necessary parts? The latter policy has been rather generally followed in the upkeep of steam power, of course, and it must be decided quickly whether there are sufficiently sound economic reasons to persuade them to extend this policy to Diesels. To settle upon the right course, managements must rely upon the informed advice of the officers actually charged with responsibility for motive power maintenance.

NOTED IN THE NEWS: The Santa Fe's "Texas Chief" soon goes in service . . . Ford K. Edwards is the director of an expanded I.C.C. Bureau of Accounts and Cost Finding, succeeding C. D. Crandall, retired. . . New divisions of east-west rates, applying as to six western roads, have been prescribed, after eight years' waiting. . . Appropriation bills on their way through Congress provide for the I.C.C., mediation board, the Office of Defense Transportation, and "federal aid" for road builders.

AIRCO STYLE 723 MULTIFLAME TIPS

help cut locomotive "out-of-service" to minimum

A damaged cylinder threatened to tie up a badly needed locomotive on a western road. The upper forward portion of the steam chest was broken away and lost. A new cylinder was not readily available—repair offered the only solution to the problem.

The road asked our Railroad Technical Sales Department for advice. We recommended casting a new section in conformity with the pattern of the fracture; then braze welding this new casting to the cylinder with Airco No. 20 Bronze Rods.

Airco Style 9803 torches, with Style 723 tips, were selected for the brazing operation. These tips were used because, due to their multiple flames, they offered a better distribution of heat—faster operation, with considerable less heat bounce than tips with a single orifice; also, they permitted better control of the bronze as it was being applied.

The booklet "Oxyacetylene Flame Processes and Arc Welding in Railroad Mechanical Operations" gives more detailed information. Write for a copy. Or, if you prefer, a Railroad Technical Representative will be glad to call on you personally. In either case, address: Dept. 7836, Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas.



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THE PUBLIC INTEREST IN SUBSTANTIAL RAILROAD EARNINGS

When President Fred Gurley of the Santa Fe invited Chicago reporters into his office recently to discuss the annual report of his road for 1947, one of the news men looked at the net income figure of $47,743,744, and ventured the opinion that it seemed to be a healthy profit—and what was the Santa Fe complaining about, anyhow? The railroad made more money only in the years 1926 to 1929, and the war years 1942 to 1944.

Cheap Dollars Buy Less

Very true, but, since one of the primary uses of net income is to buy new tools, then a railroad has to have more of it now than formerly to keep its plant modern and adequate. The reason is plain: capital costs have doubled since the period before World War II. Furthermore, the Santa Fe had to perform almost twice as much service in 1947 to come through with less net income than the 1926-1929 average. Naturally, its investment in plant to provide the 1947 volume of service had to be greater than it was in the Twenties and, therefore, the return on capital declined even more than the net.

"Net income provides either the cash or the credit," the Santa Fe head pointed out, and is, therefore, the ingredient without which new tools cannot be obtained. This being so, higher prices for tools, unaccompanied by a commensurate increase in their productivity, can mean only that the level of what may be deemed a satisfactory net income must rise in proportion.

Specific evidence of the drastic decline in the purchasing power of railroad earnings was laid before the Presidential "emergency board" hearing the wages and rules case a couple of weeks ago by Dr. J. H. Parmelee, vice-president of the Association of American Railroads. On the basis of construction indexes for both equipment and roadway and structures prepared by the Interstate Commerce Commission, said he, the $950 million of net railway operating income estimated for 1948 "will have a purchasing power, in 1935-1939 dollars, of only $552 million." In contrast, in the years 1926 to 1930, when the rate of railroad capital expansion was healthy, the corresponding purchasing power, expressed in 1935-1939 dollars, was $989 million, or an increase of $437 million over the estimated N.R.O.I. for 1948—which will be a year of far greater freight traffic. Similarly, the 1948 estimate of $603 million in net income will buy new tools worth only $350 million in terms of 1935-1939 dollars. In contrast, the average net income for 1926-1930 had a purchasing power of $655 million, or almost twice that of the 1948 estimate.

Some may say that stockholders cannot expect

a greater return on investment just because inflation is at hand. In short, the fact that railroad owners now receive cheap dollars (if indeed they are fortunate enough to get dividends at all), which give a distorted relationship between earnings and pre-inflation invested dollars, may incite melancholy, but, after all, "*someone* always suffers from inflation."

But no such easy rationalization is possible with respect to the railroads' need for a higher minimum net income. For, as Dr. Parmelee pointed out, "so great a proportion of the earnings are being, and must continue to be, devoted to the rehabilitation, replacement and improvement of their properties." If these necessary measures are to be taken, net income must be weighed realistically in terms of today's prices. The country needs tracks, cars and locomotives and signals—not profits which look good on paper only by retrospective comparison.

It is true that funds for equipment, additions and betterments come, in part, from depreciation charges, but, as the Santa Fe report explains, "modern tools and equipment cost from two to three times as much as the original cost of those being replaced, and it is original costs on which depreciation accruals are accumulated." Hence, railroad net income is now falsely magnified in two ways—it accrues after inadequate depreciation charges, and it will buy much less than formerly.

It is significant that the two railroads which, in recent years, have enjoyed the highest net incomes are now engaged in large-scale improvements of their plants. Both serve the West, a rapidly-growing area in population and industry, where traffic obviously needs an expanded and refined railroad plant.

The public has only a mild interest in the justice of reasonable earnings on railway investment. It has a very lively interest in modern, dependable and efficient railroad service. If the railroads' desire for adequate rates and a fairer competitive position were persistently translated into terms of the public's self-interest in superior railroad service, the result might be gratifying to the railroads and the public alike.

ECONOMICS AND DIESEL MAINTENANCE POLICIES

It was suggested in these pages recently that the railroads operating Diesel power are being faced with a decision of major importance in the adoption of a policy with respect to the extent to which they should establish facilities for the repair or manufacture of repair parts. It was also suggested that, whatever may be the ultimate decision of the railroads, it is a matter of such far-reaching significance that every resource should be exhausted in a sound economic study of all of the factors involved before conclusions are reached.

The Diesel-electric locomotive, because of its many inherent advantages as an operating tool, is of such great value to the railroads in their present efforts to effect economies that it would be tragic indeed should its use be handicapped by unjustified expense of operation or maintenance resulting from hastily considered practices.

Many railroads seem to be definitely headed in the direction of the establishment of facilities designed eventually to place them in a position of independent self-support with respect to Diesel-locomotive maintenance parts. That some of the larger roads are thinking in this direction is not at all surprising, for it has been traditional for them to pursue this course in the past, when the problem of producing repair parts of satisfactory quality was much simpler that it appears to be with the Diesel locomotive. Then, too often, there was no other source to look to for protection of service than their own shops.

So far, the builders of Diesel power have done a remarkably efficient job of setting up sources of supply for replacement parts which have made it unnecessary for most roads to think in terms of repairing or making their own parts; but, as the volume of work increases, due to the increasing numbers of Diesel-powered units in service, the pressure of economy in cost or the immediate availability of supply may force more mechanical officers to give thought to this question.

It has long been contended by students of railroad operation that the primary job of a railroad is to furnish transportation and that the job should be carried on without too many excursions into fields foreign to that primary function. The extent to which the railroads have engaged in manufacturing steam locomotive maintenance materials has been subject to question for many years. There are those in both the manufacturing and railroad industries who have looked upon the Diesel as the means of reaching a long desired objective and releasing the roads from the tremendous expense and investment involved in locomotive repair facilities, a large part of which have admittedly become obsolete and inefficient. If the railroads are not to follow the same course with respect to Diesel maintenance because of traditional practices, now is the time when railroad management must be shown the sound economic reasons for doing otherwise. Railroad management must look to the officers charged with the responsibility for maintenance for guidance in reaching a sound decision.

GETTING THE REAL VALUE OUT OF WORK EQUIPMENT

The railroads of the country now have well over $100 million invested in roadway work equipment and other power tools and machines with which to carry out maintenance of way and structures work, but nothing could be more true than, as pointed out by S. R. Hursh, assistant chief engineer—maintenance, Pennsylvania, in an address on February 26—as reported in *Railway Age*—that the real value of roadway machines does not lie in the amount invested in such machines, but rather in their ability, through proper use, to produce more and better work with less physical effort, a greater degree of safety, and at lower unit cost. Idle or improperly used machines, whether due to inadequate design, lack of imagination in their use, poor planning, inadequate maintenance, resistance to their use by employees, or other causes, are always less valuable than they could be, and represent an economic loss that should be reduced to the practical minimum.

So many factors are involved in getting the most out of machines that full responsibility cannot be assigned to any one officer or group of officers. Obviously, however, the major responsibility falls to engineering and maintenance officers of all ranks, and Mr. Hursh points out many practical ways in which these officers can carry out that responsibility. But to the suggestions made might well be added two others—(1) that of "selling" employees on the advantages of machine operations, and (2) that of giving active support to management in its efforts to free the railroads of working rules that prevent full use of many existing machines and restrict freedom to take advantage of still other, more efficient, machines and methods.

In both of these additional ways, maintenance officers can render an important service to their railroads and to employees generally. Mr. Hursh says that almost any man asked to use a machine becomes interested if he really believes that the machine was designed to perform better work or to make his work less laborious. The important thing, therefore, obviously, is to convince all maintenance-of-way employees that the machines made available to them are designed to do the job better than can be done by hand, and also that they not only make their work less laborious, but more interesting and safer as well.

As to restrictive working rules for employees, it is an only too well known fact that some present rules have made it necessary for the railroads to curtail or abandon the use of many machines or devices that would otherwise be of great value to them and to the services they could perform. Also, that some have greatly impaired the efficiency of other indispensable machines and operations. Such rules are patently based on the selfish interests of one or more groups to the disadvantage of the whole, and should be changed in the interest of *all* employees and the welfare of the industry.

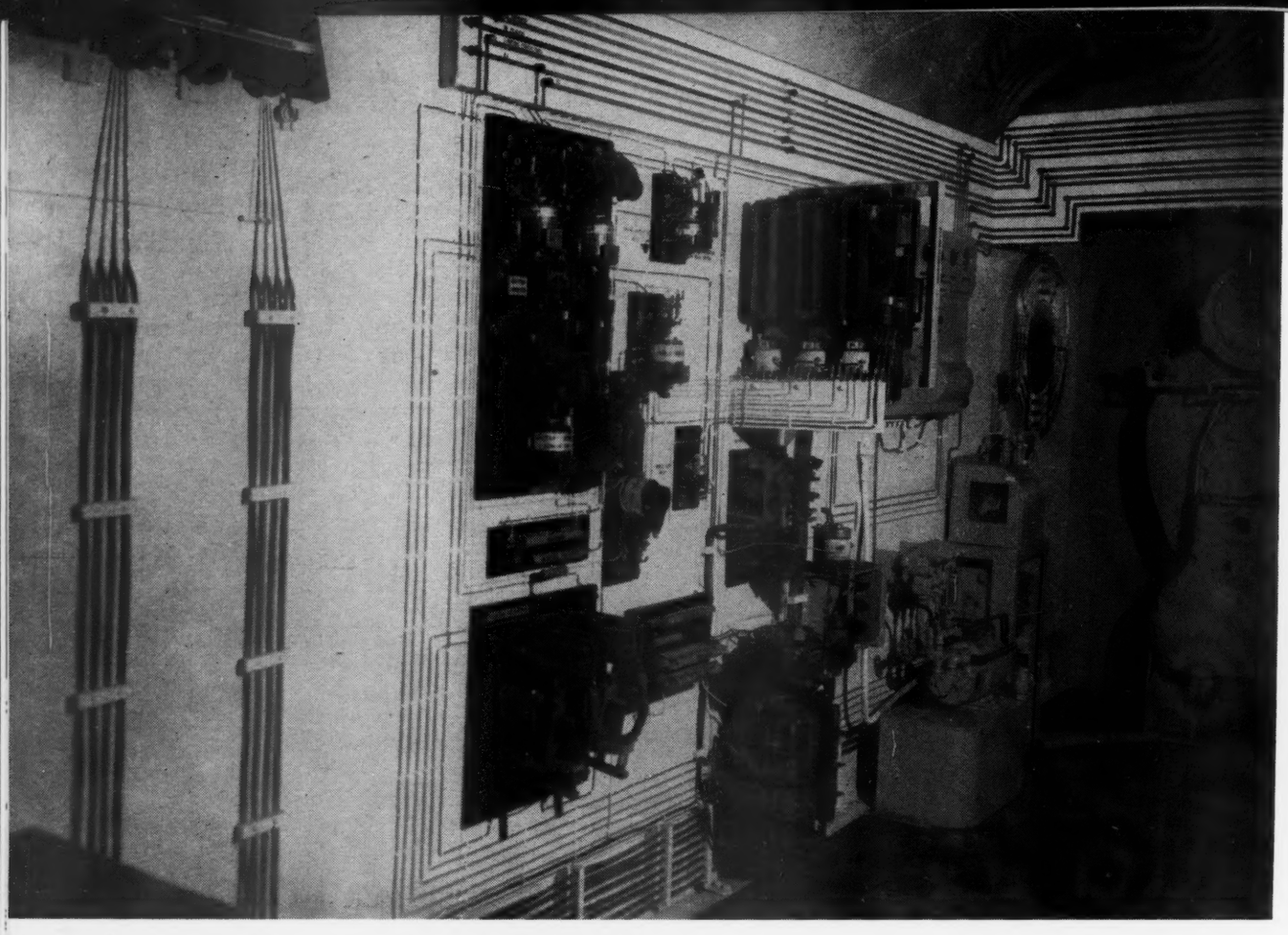
TOWARD SIMPLER TIMETABLES

The Missouri Pacific recently revised its passenger train schedules so that the number of different conditional stops therein was reduced from 52 to 3. This enabled a reduction in the number of reference marks required in the public timetable to only six.

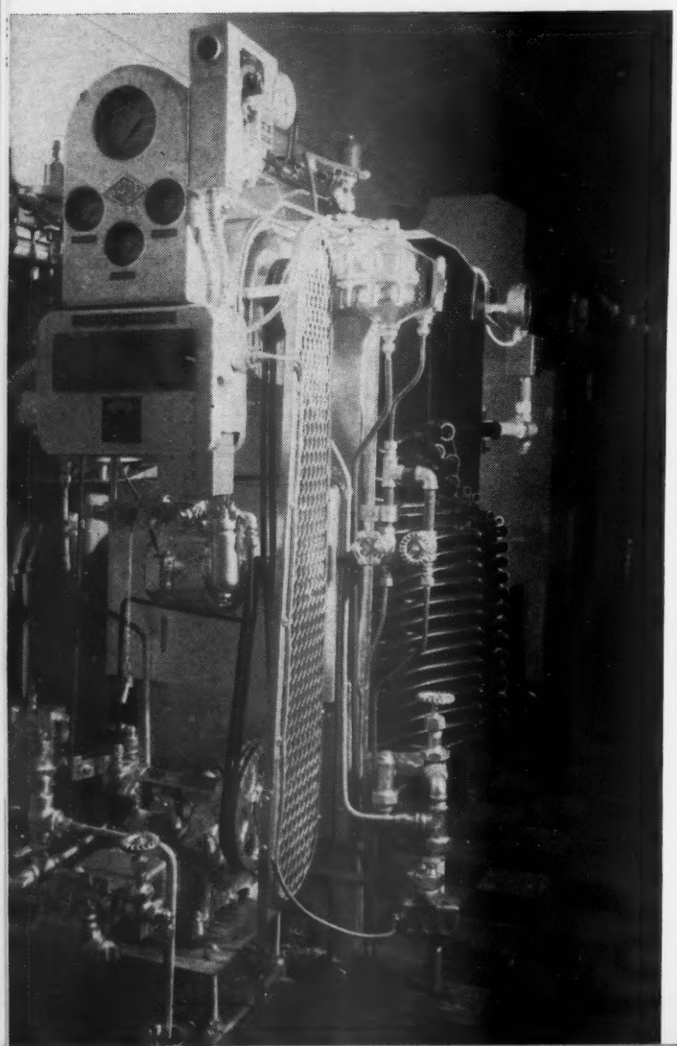
Travel by rail is certainly not encouraged by the unintelligible reference marks which complicate some timetables. Here is a specific instance: An experienced traveler—as part of a 3,000-mi. business trip—was forced to take a 200-mi. bus journey from a small Iowa town to Kansas City because there was no convenient passenger service on the only direct railway. He had checked the possibility of going by a slightly longer rail route over two other lines. His effort was in vain, because, according to the timetable, the train from his point of origin made no stop at the necessary junction, although the current issue of the Official Guide showed a "#" stop, which indicated a stop to let off passengers from stations prior to his point of origin. Quite likely the train in question makes the conditional stop every day, but the prospective customer was unable to depend on such an assumption.

To discourage further the use of the route, the train from the junction point on to Kansas City was scheduled to make an "az" stop, which meant it *would* pick up passengers for Kansas City, but no time was shown. The prior scheduled stop listed in the timetable is 2:53 p.m. and the first scheduled stop after is 7:45 p.m. In short, the traveler was faced with an unbroken gap of 4 hr. 52 min. in which he had to guess the time of the junction stop. He went by bus.

This extreme example illustrates the defects of the conditional stop as an operating practice. It would seem that the Missouri Pacific's action would be well worth consideration by other roads. If a train stops for long-distance passengers with any degree of regularity, it might as well stop for shorter-haul passengers. If the train is required to stop only rarely, the conditional stop might as well be abolished altogether.



Above—A model of a Diesel locomotive (upper left foreground). Adjoining it are control units and a live diagram of control circuits. Below—The "mock up" of a Diesel steam generator unit



F. E. C. BUILDS DIESEL INSTRUCTION CAR

The Florida East Coast has completed an instruction car which incorporates many improvements over an older car used for many years in educating its transportation and mechanical employees in locomotive and air-brake operation and maintenance.

After a study of many such cars on other railroads, the layout was designed and built by the company's own forces at its St. Augustine, Fla., shops. One of the improved features of the car is a more complete exposure of all working parts, units and electrical circuits, particularly those involved in Diesel locomotive operation. The car is of all-steel construction, having been converted from a passenger coach with an inside length of 70 ft.

The Locomotive Equipment

The Diesel locomotive equipment was supplied by the Electro-Motive Division of General Motors Corporation. It consists of a complete Diesel engineman's control stand, mounted on a raised platform, a "mock up" of two cylinders of a Diesel engine with governor, governor control, injector linkage, and cut-away

cylinder head. A lever-operated injector is used to demonstrate the injection of fuel into the cylinder.

Also included is a load regulator, a complete set of No. 1 engine control equipment and a "mock up" of the main generator with field coils traced in colors. Small lights indicate the presence and intensity of the field excitation as controlled by the load regulator. The wheels of a model Diesel locomotive mounted on the wall operate both forward and reverse in complete response to the manual and automatic control units.

Wiring of Control Units

The control units of a Diesel were removed from their cabinets and mounted on a plywood wall in their relative positions, but spaced sufficiently to permit individual wiring. Where possible, these wires are run in straight lines on the wall and are painted in different colors to form a live working diagram of the complicated high and low voltage circuits.

The nine important control circuits are wired in different colors from the distribution panel, control switch box and control stand. Each circuit is traced in identifying colors with small lights to indicate when the circuit is energized. There is also a panel above the control circuits, in plain view of the entire classroom, to indicate the position of the throttle and reverse lever.

A "mock up" of a Vapor Clarkson CFK4225 steam generator, with coils and heat exchanger cut away, operates through various safety devices. It is used to demonstrate the construction and operation of this unit of a Diesel locomotive.

The Brake Equipment

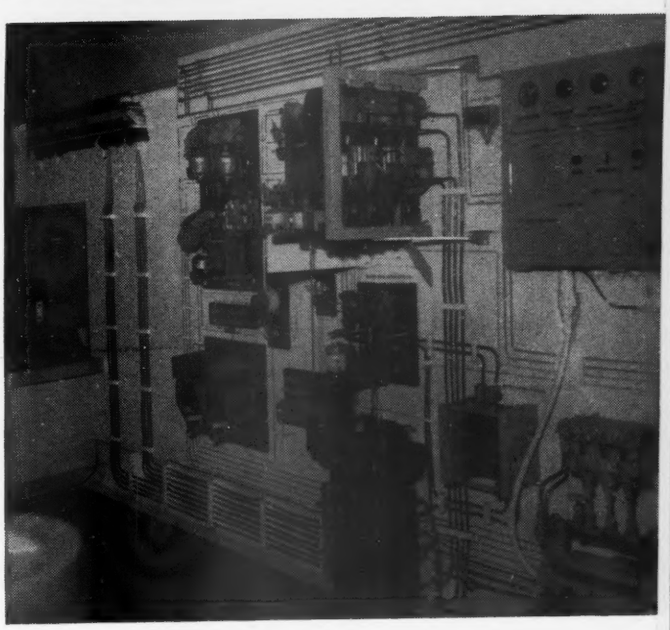
The brake equipment consists of a complete set of HSC car brakes electrically connected to a large diagramatic drawing of two HSC car brakes with small lights to illustrate the electric brake and speed-governor control circuits. The balance of the equipment in the car is more or less standard as to air-brake and steam locomotive operation.

A 16 mm. motion-picture projector with sound effect has been installed to show pictures in connection with Diesel locomotives, roller bearings, and other educational topics.

Power for the car is derived from a motor-generator located on the rear platform which provides 64-volt d.c. current, and a motor-driven compressor. Both motors operate on 220-volt three-phase a.c. current. Two 20-inch fans, mounted in side windows, cool the car in summer. It is warmed in winter by an oil-heater. Fluorescent lighting is used throughout.





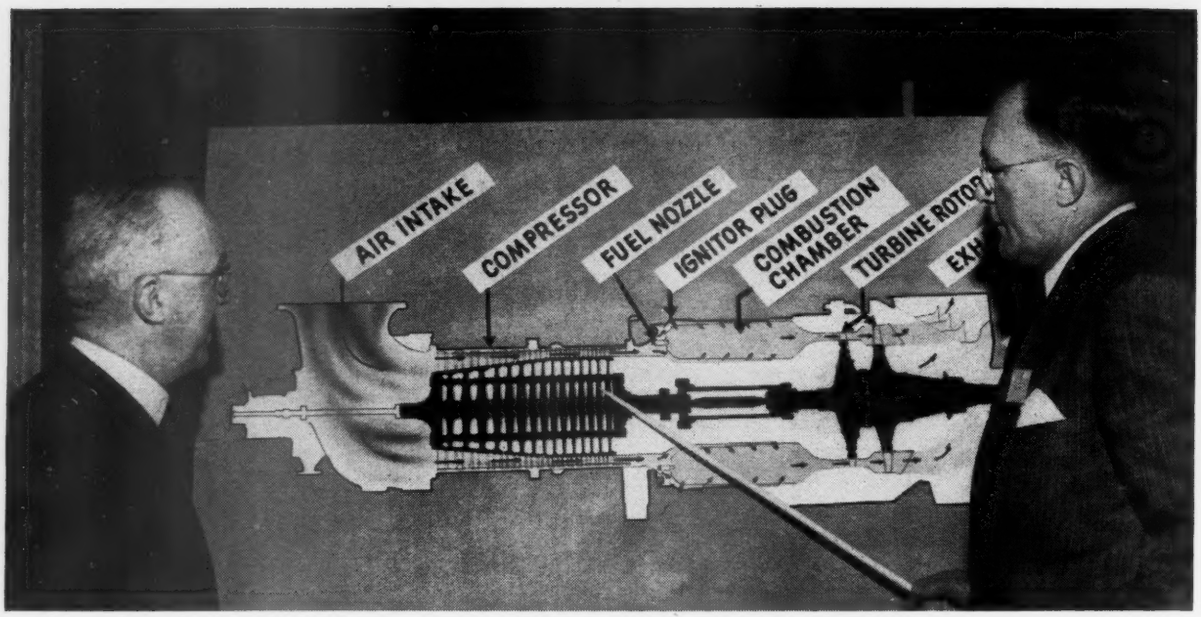


CAPTIONS READ TOP TO BOTTOM

The Diesel locomotive engineman's control stand and the HSC brake equipment

Looking toward the front of the F.E.C. instruction car

Another view of the high- and low-voltage Diesel locomotive control circuits

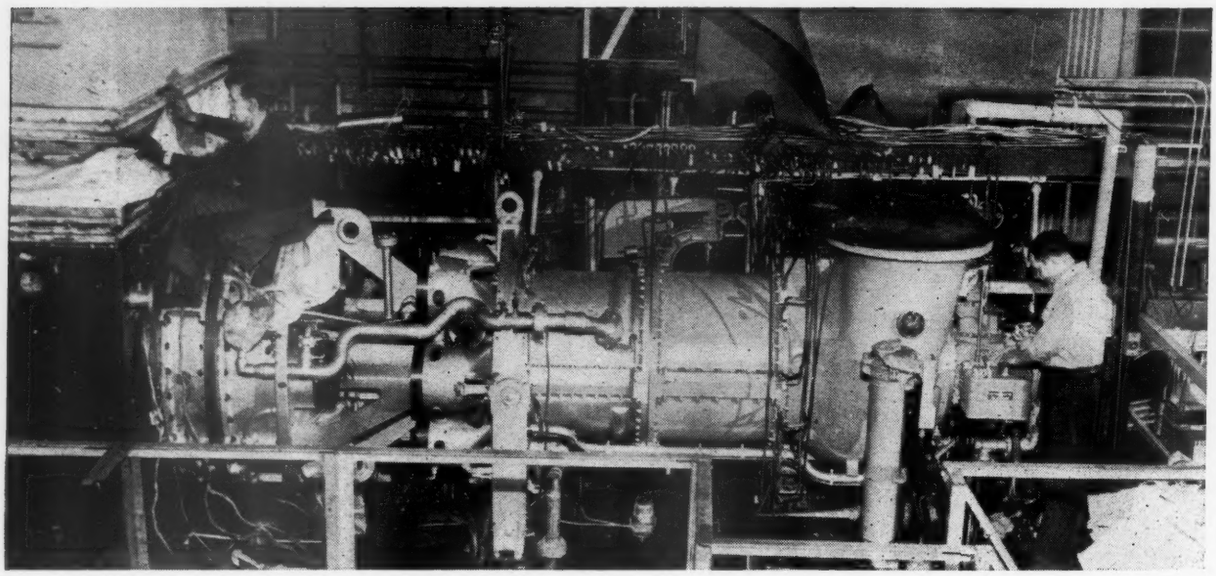


Robert B. McColl, (left), president of the American Locomotive Company and Charles E. Wilson, president of the General Electric Company, discuss the operation of the locomotive gas turbine

LOCOMOTIVE GAS-TURBINE DEMONSTRATED

The General Electric Company gave a demonstration of its gas-turbine power plant for locomotives on March 3, at Schenectady, N.Y., to a large group of railroad executives and engineers, and members of the technical press. At a breakfast meeting, G. W. Wilson, manager, Locomotive and Car Equipment Divisions, General Electric Company, introduced Charles E. Wilson, president of General Electric, who extended greetings to the visitors. A report on design features of the 4,800-hp. gas-turbine power plant prepared by Alan Howard, engineer, Turbine-Generator Engineering Division, General Electric Company, was presented by Lawrence R. Lee.

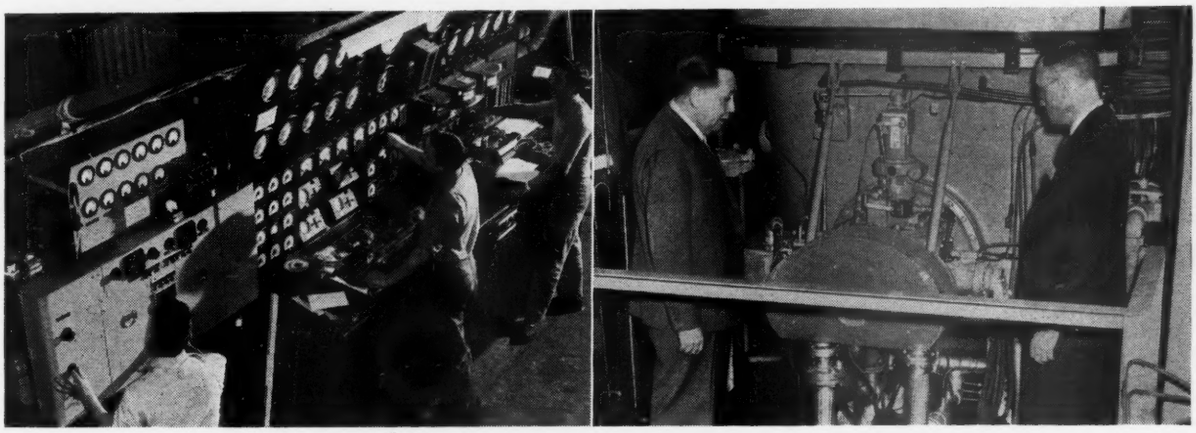
Visitors then were conducted through a section of the research laboratory devoted to the development of special materials required for gas turbines. Some of these tests have been carried on through a period of eleven years. From the laboratory, the guests were given a chance to inspect the gas-turbine in operation on a test stand. As now developed, the power plant weighs 20,000 lb., is 19 ft. long and delivers 4,800 hp. The turbine inlet temperature is 1,400 deg. F., the compressor pressure is 5 atmospheres gage, and the overall thermal efficiency is over 17 per cent.



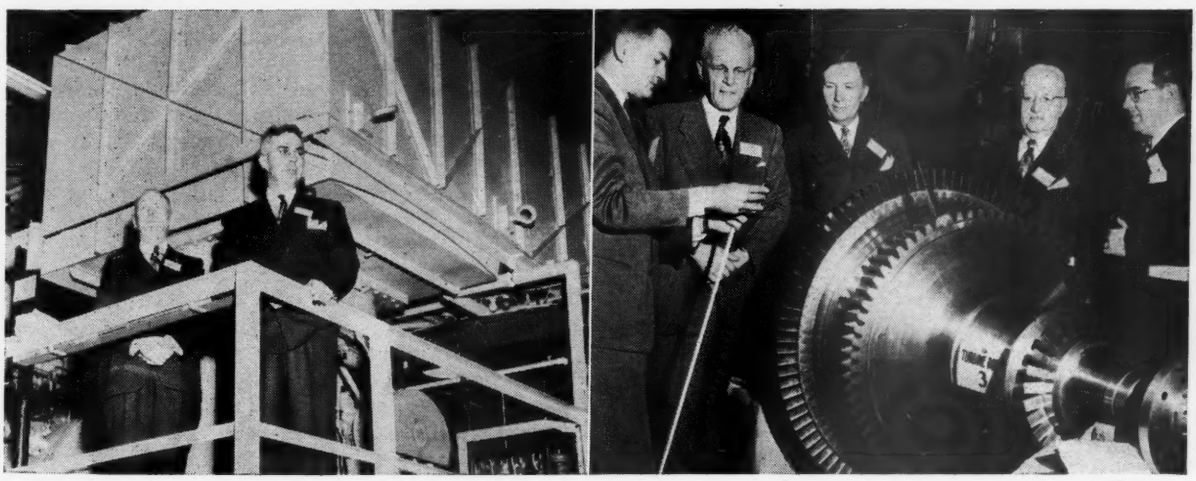
The turbine, rated at 4,800 hp., has been operated in factory tests since September, 1947



Left—Various parts of the turbine similar to those in service were on display adjoining the test stand. The compressor rotor is shown here. Right—G. W. Wilson, manager, General Electric Locomotive and Car Equipment Divisions, R. E. Woodruff, president of the Erie, and A. W. Munster, vice-president of the Boston & Maine, reading left to right, are examining a cutaway section of the compressor housing



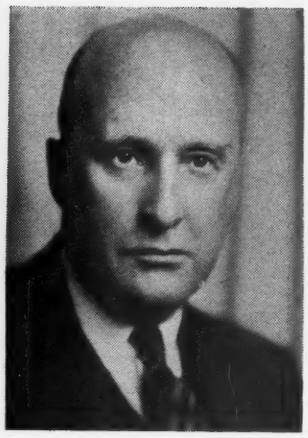
Left—Turbine test control station. The light-colored panel at the left is the starting and control panel which will be installed in the locomotive cab. Right—E. S. Gunn, of General Electric (left), and P. H. Hatch, general mechanical superintendent, New York, New Haven & Hartford, examine the main controls mounted at air intake end of turbine



Left—Paul Kiefer, chief engineer, m.p. & r.s., New York Central (left), and J. D. Loftis, chief of m.p. & equipment, Atlantic Coast Line, in front of the air intake end of the turbine. The duct above is used for test purposes only. Right—A General Electric engineer discusses the design of the turbine rotor with F. G. Baker, electrical engineer, J. L. Ryan, mechanical engineer, and W. B. Berry, superintendent of motive power, all of the St. Louis-San Francisco, and C. C. Davis, American Locomotive Company



George A. Walker



W. M. Neal



William A. Mather

NEW CANADIAN PACIFIC EXECUTIVES — WALKER AND MATHER SUCCEED NEAL

George A. Walker, whose election as chairman of the Canadian Pacific to succeed W. M. Neal was reported in last week's *Railway Age,* was born in Toronto, Ont., on October 8, 1879. From 1906 until 1911 Mr. Walker was solicitor for the C.P.R. as a member of the law firm of MacMurchy, Spence & Walker. In 1911 he was appointed solicitor for the road in Calgary, Alta. Twenty-three years later he transferred to Montreal, Que., as assistant general solicitor. In 1936 he was appointed general solicitor, and, 1945, vice-president and general counsel. Mr. Walker was named senior vice-president and elected to the executive committee in February, 1947. He has been a member of the board of directors since January of the same year.

Mr. Mather's Career

William A. Mather, whose election as president to succeed Mr. Neal also was announced in last week's issue, had been vice-president at Winnipeg, Man., since May, 1942. Born in Oshawa, Ont., on September 12, 1885, he attended public and high schools there before going to McGill University, from which he was graduated in engineering in 1908. Mr. Mather's railroading career began in 1903, while he was still attending school, when he entered the construction department of the C.P.R. He was resident engineer at Winnipeg from January, 1911, until March, 1912, when he transferred to the operating department as acting superintendent at Kenora, Ont. During the first six months of 1915 he was superintendent at Medicine Hat, Alta. In June of the same year he was appointed assistant general superintendent of the British Columbia district, and, in October, 1918, general superintendent of the Saskatchewan district.

Mr. Mather was general superintendent at Calgary from December, 1932, until May in the following year, when he was appointed assistant to the vice-president of the company at Montreal. In September, 1934, he returned to the west as general manager of western lines with headquarters in Winnipeg, the position he held until his election to the presidency on March 8.

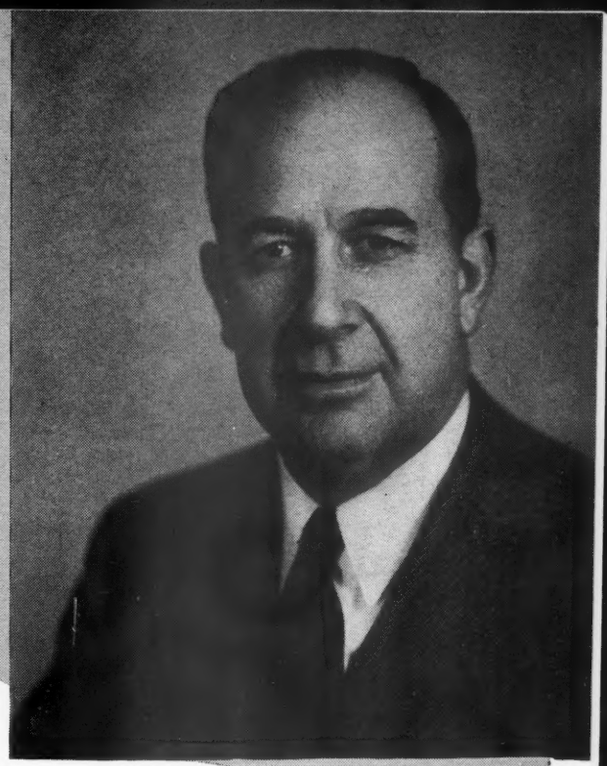
Last Year's Financial Results

Mr. Neal, who resigned because of serious ill health, had been president and chairman since February 1, 1947. (See *Railway Age* of January 18, 1947, for details of his career). Mr. Neal has been recuperating in Jamaica this winter from an illness of some months' duration and he submitted his resignation on the insistence of his medical advisors. He entered railroad service in 1902 as a clerk in the office of the C.P.R. superintendent at Toronto.

Gross earnings of the C.P.R. last year—11 months of which were in Mr. Neal's term as chief executive—totaled $318,585,919, compared with $292,495,828 in 1946. Working expenses, including taxes, amounted to $295,693,730, compared with $271,652,778. Net operating earnings were $22,892,189, compared with $20,843,050. Other income was $24,788,927, thus bringing the income available for fixed charges up to $47,681,116. In 1946 other income totaled $22,779,794 and income available for fixed charges was $43,622,884. Fixed charges in 1947 were $15,787,174, compared with $18,488,113.

Net income amounted to $31,893,942, which after the payment of $11,257,682 in dividends, left a balance of $20,636,260 for transfer to the profit and loss account. Net income in 1946 was $25,134,731.

A. R. E. A.
CONVENTION SECTION

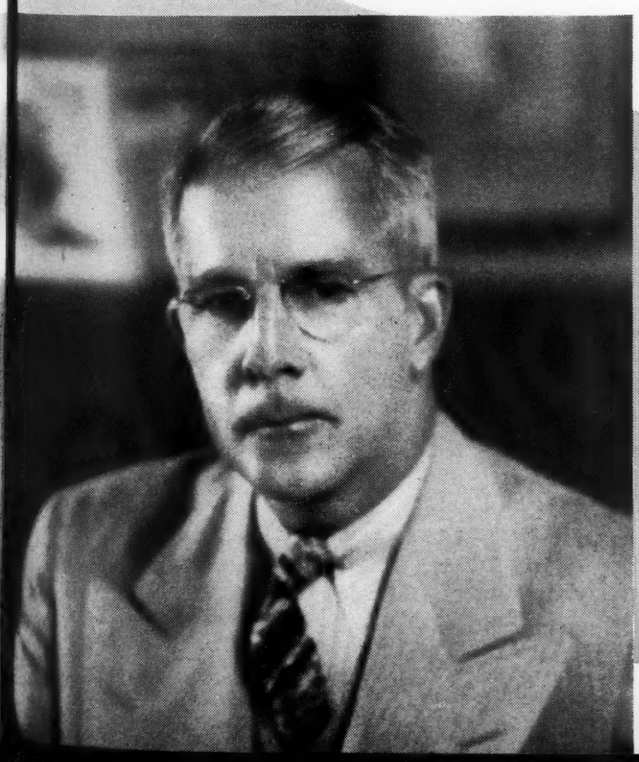


Armstrong Chinn, Pres. A.R.E.A.

CONTENTS

This section contains a complete account of the convention held at Chicago on March 16-18, including abstracts of all the addresses and committee reports that were presented, and pertinent comments made in discussion from the floor. It also contains a list of all the companies participating in the exhibit of the National Railway Appliances Association, including the names of their official representatives and an account of the products displayed

C. L. Mellor, Pres. N.R.A.A.



N. R. A. A.
LIST OF EXHIBITORS



C. H. MOTTIER
President-Elect

ENGINEERS GET NEW IDEAS AT A.R.E.A. CONVENTION

Many committee reports and addresses on timely subjects are heard at forty-seventh annual meeting at Chicago

Progress in the solution of problems facing the engineering and maintenance officers of the nation's railroads received another boost this week when many of them gathered for a three-day session at the Palmer House, Chicago, under the auspices of the American Railway Engineering Association, which held its forty-seventh annual convention during that period. Contributing materially to the success of the affair was the annual exhibit of the National Railway Appliances Association, on view concurrently at the International Amphitheatre, in which 100 manufacturers joined in displaying a great variety of products used in the construction and maintenance of the railroads' fixed properties.

Board of Direction, A.R.E.A., 1947-48

PRESIDENT
Armstrong Chinn, president, T.R.R.A. of St. Louis, St. Louis, Mo.

VICE-PRESIDENTS
C. H. Mottier vice-president and chief engineer, I.C., Chicago.
F. S. Schwinn, assistant chief engineer, M. P., Houston, Tex.

PAST-PRESIDENTS
E. M. Hastings, chief engineer, R.F.&P., Richmond, Va.
H. R. Clarke, chief engineer, Burlington Lines, Chicago.
F. R. Layng, vice-president, and chief engineer, B.&L.E., Greenville, Pa.
A. A. Miller, chief engineer m. of w. and s., M.P., St. Louis, Mo.
J. B. Akers, chief engineer, Sou., Washington, D. C.

DIRECTORS
F. E. Bates, senior executive assistant, M.P., Houston, Tex.
E. E. Oviatt, chief engineer, N.Y.N.H.&H., New Haven, Conn.
R. E. Dougherty, vice-president, N.Y.C. System, New York.
C. H. Blackman, chief engineer, L.&N., Louisville, Ky.
S. E. Armstrong, engineer m. of w., N.Y.C. System, New York.
J. S. McBride, chief engineer, C.&E.I., Chicago.
T. A. Blair, assistant chief engineer system, A.T.&S.F., Chicago.
W. D. Simpson, chief engineer, S.A.L., Norfolk, Va.
H. S. Loeffler, assistant chief engineer, G.N., St. Paul, Minn.

TREASURER
J. D. Moffat, chief engineer, Western region, P.R.R., Chicago.

SECRETARY
W. S. Lacher, 59 East Van Buren street, Chicago.

ASSISTANT SECRETARY
Frank McNellis, 59 East Van Buren street, Chicago.

Research Emphasized

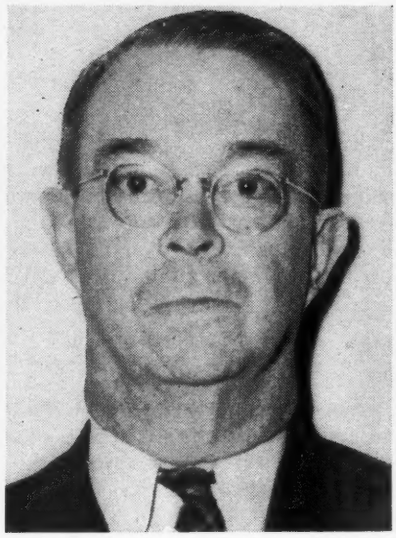
Following the pattern of previous meetings the A.R.E.A. convention was devoted for the most part to a consideration of reports prepared by the associations' standing committees. Such reports, dealing with 97 different subjects, were presented this year by 21 committees. However, the consideration of these reports was interrupted at times throughout the three-day session to permit those present to listen to timely addresses, some of which were much in the nature of progress reports on various research projects now being carried out under the sponsorship of the A.R.E.A.

With a large and attentive audience, the convention was opened on Tuesday morning with an address by Armstrong Chinn, president of the A.R.E.A., and president of the Terminal Railroad Association of St. Louis. Mr. Chinn's remarks were largely in the nature of a general review of the association's activities during the past year, with emphasis on developments of an administrative nature. Matters dealt with in the report of Walter S. Lacher, secretary, included the financial results for the calendar year 1947, the trend of membership in the association, developments in connection with the printing of the association's Manual and bulletins, the work of the standing committees, and the research program of the Engineering division of the A.A.R., the latter including a list of the projects in progress during the past year, showing the funds appropriated for them.

Regarding the membership Mr. Lacher reported that the net increase during the year was 118, bringing the total number of members to 2,334, the highest level since 1932. He reported that the net increase in the membership during the last twelve months was greater than in any corresponding period since 1929. "Of even greater interest," he said, "is the fact that the total of 2,334 as of February 1 of this year indicates an increase of 454 members, or about 24 per cent, over the number on March 1, 1939, when the membership reached the lowest level as the result of the depression." Another development brought out in Mr. Lacher's report is that an attempt is being made to publish more of the reports on research in



Fred S. Schwinn
Vice-President



G. L. Sitton
Vice-President-Elect



Walter S. Lacher
Secretary

the summer bulletins instead of attempting to crowd as many as possible into the January and February bulletins.

A concerted effort is also being made, he said, to reduce the length of the reports on research.

The keynote of the convention was sounded during the opening session in an address by J. H. Aydelott, vice-president, Operations and Maintenance department, A.A.R., who devoted his remarks largely to the purpose and value of research. Other addresses were presented during the opening session by J. A. Beoddy, chairman Signal section, A.A.R., and superintendent of telegraph and signals, Norfolk & Western, and by K. H. Gordon, chairman Electrical section, Engineering division, A.A.R., and assistant electrical engineer, Pennsylvania. The principal purpose of the addresses by Messrs. Beoddy and Gordon was to bring members of the association up to date regarding recent developments in the fields of signaling and electricity.

Representing an interlude from the strictly business sessions of the convention was the annual luncheon on Wednesday, which was addressed by Clark Hungerford, president of the St. Louis-San Francisco.

The remaining addresses presented during the meeting were of a technical nature, dealing either with research work being carried out under the sponsorship of committees or with technical matters of particular concern today. The first address of this nature, on Roadway and Ballast, was one by Rockwell Smith of the research staff, Engineering division, A.A.R.,

The report of the Committee on Rail, presented during the afternoon session on Wednesday, was followed by discussions or addresses by three research workers participating in projects related to the work of this committee. For instance, R. E. Cramer, special research associate professor, University of Illinois, presented an oral report covering three subjects which were dealt with in detail in the committee report. Similarly, R. S. Jensen, special research associate, University of Illinois, presented an illustrated lecture covering material included in the sixth progress report of the rolling load tests of joint bars, also as presented in the report of this committee. During the same session G. K. Manning, addressed the group on the work that is being done in connection with the study of shelly rail now under way at Battelle Memorial Institute.

Two addresses were presented during the Thursday session. One of these, by Dr. Ruth D. Terzaghi, dealt with the" "Surface Deterioration of Concrete." The other, by Dr. R. B. Peck, research professor of soil mechanics, University of Illinois, was entitled "Some Factors Influencing Failures of Abutments and Retaining Walls."

All sessions of the convention were presided over by President Chinn, assisted by Vice-President C. H. Mottier, vice-president and chief engineer, Illinois Central, Chicago, and by Secretary Lacher. The registration at the meeting included 940 members and 750 guests, a total of 1,690, which compared with a registration of 845 members and 665 guests, a total of 1,490, at the 1947 annual meeting.

Election of Officers

The following officers were elected to direct the affairs of the association during the ensuing year: President, C. H. Mottier, vice-president and chief engineer, Illinois Central, Chicago; vice-president to serve for two years, G. L. Sitton, assistant chief engineer, Southern, Washington, D.C.

The directors named were E. C. Vandenburgh, chief engineer, Chicago & North Western, Chicago; C. G. Grove, chief engineer maintenance of way, western region, Pennsylvania, Chicago; and R. L. Groover, chief engineer, Atlantic Coast Line, Wilmington, N. C. Members of the nominating committee are I. H. Schram, chief engineer, Erie, Cleveland; E. J. Brown, engineer of track, Burlington Lines, Chicago; E. E. Mayo, chief engineer, Southern Pacific, San Francisco; W. L. Young, principal assistant engineer, Norfolk & Western, Roanoke; and M. H. Dick, engineering editor, *Railway Age*, Chicago. In addition, F. S. Schwinn, assistant chief engineer, Missouri Pacific, Houston, and vice-president of the association, was advanced automatically to senior vice-president, succeeding Mr. Mottier.

Following are abstracts of the addresses by President Chinn and by Messrs. Aydelott, Beoddy, Gordon, Hungerford, Smith, Peck and Manning and Dr. Terzaghi. This issue also includes abstracts of all of the committee reports, indicating the action taken in connection with recommendations regarding Manual material.

President's Address

In his address at the opening session President Chinn first called attention to the fact that the association is approaching the half century mark, and then paid tribute to "the pioneers who laid the ground work for our association," pointing out that there have been but few changes in the rules they laid down "for the form and substance of our work, and none whatever in the basic objectives.

Following a discussion of these objectives, President Chinn took up the question of research, pointing out that "the various committees in their studies are carrying on research in a practical way, some of it in laboratories but most of it in the field under actual traffic conditions." This generally takes more time than in the laboratory," he said, "but, where the answers can be so obtained they are usually more conclusive."

Gratifying evidence of the growing appreciation of the value of research in the field of tracks and structures, said President Chinn, is presented by the "progressively increasing appropriations" that are being made for this work. He pointed out that the total of the amounts allotted for 44 different projects, together with the administration thereof, for the current year, is $291,840, which compares with an allotment of $234,428 for 1947, and only $69,250 in 1940.

Others matters discussed by Mr. Chinn included the increases in membership dues recently voted by the members, the financial results for 1947 and the "heartening" increase in the number of members that occurred in the past year, as revealed in the report of the secretary. He expressed gratification regarding the number of young men who are joining the association, and urged these new members, as a means of getting the greatest benefit from their membership, to join one or more of the committees and participate actively in committee work. "I know of no better way," he said, "for a young man to broaden his knowledge, enlarge his friendships among railroad men, demonstrate to others in his profession his knowledge and ability and generally prepare himself to creditably discharge the greater responsibilities that come with promotion."

President Chinn said, however, that an intensive effort to recruit younger members for service on committees "has not been entirely successful . . . indicating that in some cases, at least, there has been a lack of sympathetic support on that part of their superior officers." "The solution of this difficulty," he said, "is not a simple one and demands persistant attention."

Referring to contemplated changes in the constitution, to be placed soon before the membership by letter ballot, Mr. Chinn said that the first of these will propose liberalizing the requirements for admission so that consulting engineers would be eligible for admission to the grade of Member. A second amendment, he said, will propose that the number of past-presidents on the Board of Directors be reduced from five to two and that the number of directors be increased by three.

The address by Dr. Terzaghi during the Thursday session was a comprehensive analysis of factors bringing about the deterioration of concrete. Dr. Terzaghi first showed how certain practices regarding concrete manufacture have been changed over the years in an effort to obtain longer life from concrete structures, although the results have not been entirely satisfactory. In fact, some engineers, she said, "even go so far as to say that the best modern concrete is less desirable than concrete placed many years ago."

The introduction of air entrainment as a means of getting concrete of greater durability was next discussed by Dr. Terzaghi. Convincing reasons were advanced as to why air entrainment should produce better concrete, but to determine whether these conclusions are correct, she said, would require 20 or 30 years of observation, of this reason, a research program has been undertaken under the direction of the Engineering division of the A.A.R. in an effort to determine the answer to the problem of concrete deterioration as rapidly as possible. This is to be done, she said, by attempting to discover why durable concrete is superior to that which is less durable, and by determining what specific processes are causing the deterioration of modern concrete and what characteristics of this concrete have rendered it particularly susceptible to these processes.

Next Dr. Terzaghi discussed at length the various causes of rapid deterioration of concrete, which discussion was followed by an analysis of the causes of slow deterioration.

Stabilizing Sliding Fills

Mr. Smith's address before the Wednesday morning session was a discussion of certain work done and progress made in connection with a field investigation of methods for stabilizing roadbeds. This investigation is being carried out by the research staff of the Engineering division, A.A.R., under the sponsorship of the Committee on Roadway and Ballast.

Mr. Smith pointed out that, during the past three years, considerable work has been done in stabilizing sliding fills by grouting, with the heights of the fills ranging up to 70 ft. His discussion of the results obtained was prefaced by remarks regarding the conditions that cause fills to slide. Experience shows, he said, that instability under today's traffic, occurs only in those subgrades containing clays of the higher plasticity characteristics. Even such clays as these would be harmless without the presence of water, according to Mr. Smith.

Mr. Smith then described the three general types of fill instability that have been observed in the course of the investigation. The first type occurs where fills are unstable in themselves, as evidenced by slope failure and plastic flow. The second type occurs where the entire fill moves outward on an inclined and lubricated plane, while the third condition that has been observed involves a failure in the foundation of the fill, such as in swampy areas.

Illustrative slides were presented by Mr. Smith to

show "a few of the salient points of fills treated in the past two years by pressure grouting; also the methods used in the grouting." In all cases, he said, the work has been very successful in stabilization.

Aydelott on Research

The remarks by Mr. Aydelott at the opening session on Tuesday were concerned for the most part with the value and necessity of research activities as a means of helping the railroads to meet the future transportation requirements of the nation. According to the speaker, "the progress made by the railroads in the two decades immediately preceding World War II, much of it as a result of intensive research both within and without the industry, enabled them to handle record-breaking tonnages, primarily of materials required in the war effort, with about a half million fewer freight cars and many thousand fewer locomotives than were available in the 1930's."

Discussing the difficulties of making progress in strengthening and improving the facilities during national emergencies, Mr. Aydelott said that the railroads must take full advantage of the opportunities afforded in peacetime years to advance their research activities and to "plow back a sizeable share of their earnings into improvements of the plant."

Referring to "the segment of the public that is actually beginning to believe that our railroads are 'asleep at the switch' when it comes to scientific study," Mr. Aydelott said that this is a false impression and that every effort should be made to correct it. At this point he advanced arguments to prove that the railroads have made "great strides in improving their plant, equipment and methods" and that these have come about only through the investment of "billions of dollars in better plant and facilities and by exhaustive research." Furthermore, he said that the railroads are fully aware of the necessity of continuing their research activities and that they are "actually doing more research than ever before and doing it in more directions." In this connection he referred to the work being done by the Association of American Railroads, through its Engineering division, which "is carrying on more than 60 projects to improve track and structures."

Extending a word of caution, Mr. Aydelott said that "we should not overlook the responsibilities that go along with research work." One of these, he said, is that the money appropriated for scientific investigation be spent prudently. Another is the application of the results obtained. "Some people," he said, "are under the impression that research work has no purpose other than to confirm their own preconceived ideas on established practices. To these people, any data running counter to their ideas or usages should be disregarded as faulty. If railroad research is to attain what it sets out to accomplish, such people must have the courage to admit when they are wrong. Otherwise, time and effort and money expended on such work is wasted and real progress is retarded."

Meeting Today's Problems

This spring, said Mr. Hungerford in his address before the annual luncheon on Wednesday, "marks the twenty-fifth anniversary of what to my mind is the most forward and constructive step ever taken by the American railroads." This step, he asserted, was largely responsible for the ability of the railroads to do their job during the recent war and to handle a record-breaking peacetime traffic now under trying conditions. In explaining what he had in mind Mr. Hungerford reviewed the railroad situations. In explaining what he had in mind Mr. Hungerford reviewed the railroad situation as it prevailed following World War I, recalling the depression of 1921, the rapid increase in freight traffic in 1922 and 1923, and the urgent necessity for taking measures to rehabilitate the railroads in order that they could handle the traffic developing.

Mr. Hungerford then said that the development he had in mind was the meeting of the American Railway Association and the Association of Railway Executives (since merged into the Association of American Railroads), held in New York on April 5, 1923, at which a number of decisions were made that were aimed at correcting the situation. The first of these, he said, was the announcement of the authorization for an expenditure of $1,100,000,000 for the year 1923 for equipment and trackage and other facilities. Another was a pledge to bring about a drastic reduction in the number of bad-order cars and locomotives, and a third was directed toward getting more effective use of the railroad plant after it had been improved. As part of the latter objective, said Mr. Hungerford, the Northwest Shippers Advisory Board was organized in January, 1923, and, "this was the beginning of the regional Shippers Advisory Boards and the national association of these boards." Without these boards, he said, "the improvement program launched by the railroads in the spring of 1923 could not possibly have been as effective as it was."

Reciting the results of the program started in 1923, Mr. Hungerford said that it had an immediate and long-range effect, permitting the railroads "to meet one transportation emergency after another as it developed." He then drew an analogy between the situation in 1923 and the one confronting the railroads today, asserting that, "if the railroads are to meet current and future demands satisfactorily, they must continue and expand the improvement program started in 1923." The speaker then reviewed briefly the railroads' plans for accomplishing this end, pointing out that their capital expenditures for additions and betterments this year "will reach, if not exceed, the level of such investments just before the last depression," and that they have on order approximately a billion dollars' worth of new rolling stock.

Progress in Signaling

Mr. Beoddy's comments at the opening session consisted of a review of recent developments in the signaling field. Explaining that the past year had not seen the development of any novel or outstanding features in railway signaling, Mr. Beoddy said he could report "steady improvement in the systems which were already in use, looking to refinements in design and adaptations and the continuing application of all of these systems where they will result in greater safety and facility of operations."

He first dealt with the increasing application of centralized traffic control, particularly to the problems

of reverse operation on multiple tracks "where the advantage of this form of control can be taken to use both tracks of a double-track line for the movement of trains in the same direction at times when there is no interfering movement." He said that the application of modified system of C.T.C., in which train movement is directed by the dispatcher from a central point but in which the switches are not controlled, is being studied and several installations have been made.

Discussing the application by signal engineers of new developments in scientific or industrial progress Mr. Beoddy said that the latest of these was the application of the principles of electronics. The use of carrier and radio systems has demonstrated, he said, that no limit is placed on the distance from which switches and signals can be controlled or indications received. Also, he said, "through the medium of carrier equipment greater use is being made of metallic circuits, with a consequent decrease of materials necessary and reduction in costs of installation."

Credit was extended by Mr. Beoddy to the signal supply industry "in cooperating with the railroads in working out their problems in the signal field and in developing apparatus to meet these problems."

In the Electrical Field

Mr. Gordon's address at the opening session was largely a review of recent developments in the electrical field, with particular reference to the railroads. Pointing out that the electrical generating industry reached an all-time high during the year just past, he said that the generating capacity in utility and government-owned plants at the end of the year was about 69,300,000 hp. This, he said, does not include the electricity used to light trains or to move Diesel-electric locomotives. At the end of the year, he added, the railroads had on hand or on order some 11,300,000 hp. of Diesel-electric motive power, a sizeable proportion of the total capacity of the power industry.

Turning to a consideration of recent developments in the electrical field, Mr. Gordon first pointed to the new steam turbine-electric locomotive recently built for Chesapeake & Ohio, and referred to the development work being done on a gas-turbine locomotive which, he said, will no doubt have an electric drive.

Following a brief discussion of developments in illumination, Mr. Gordon spoke of high frequency heating, especially for cooking, and described briefly the use of infra-red heating for such tasks as drying paint, textiles and blueprints, and drying and baking armatures and field coils in electrical manufacturing and repair shops.

Other subjects given attention by Mr. Gordon included the so-called heat pump as a means of heating homes and other buildings electrically; an electronic means of maintaining register, or precise superposition of successive colors in color printing; a device for controlling temperature automatically, which, he said, might well find a place on the railroads for some such application as a hot box detector, or for measuring the temperature of rails under a moving train; and the wartime development of the proximity fuse, for which he sees possible applications in the railroad field, including its use for warning track gangs of approaching trains.

Professor Peck's address during the Thursday morning session, following presentation of the report of the Committee on Masonry, was based to a large extent on the analysis of answers to a questionnaire sent to the chief engineers of a considerable number of American railways, requesting information about retaining walls or abutments that had failed or that had experienced undesirable progressive movements.

Various deductions regarding the conditions causing the failure of these walls and abutments were discussed by Professor Peck. While the records are still being studied and analyzed, it is believed, he said, that several definite conclusions can be drawn at the present time, viz:

(1) Considering the total number of conventionally designed retaining walls and abutments, failures or progressive movement is a relatively uncommon occurence.

(2) Unsatisfactory behavior is rarely encountered unless the subsoil of the wall, or its backfill, or both, contain clays or clay-like materials. The most prevalent cause of trouble is the overloading of clay foundations by the weight of the backfill. The second most common cause is probably the gradual increase of pressure when the backfill material consists of clay. A possible third cause of some importance is the increase of live load.

(3) Contrary to the opinion of some engineers, it seems doubtful that the effects of vibration due to traffic on granular backfills are of serious importance. Otherwise it is probable that more difficulties would have been reported with walls backfilled with sand.

(4) The unsuccessful behavior of walls has been due primarily to misjudgment of the foundation conditions. Present methods of design place the emphasis almost exclusively on computed earth pressures that often have little relation to the real forces that the structures must resist.

Shelly Rail Study

In his address during the Wednesday afternoon session, giving the results to date of the study of shelly rail at Battelle Memorial Institute, Mr. Manning first described two lines of approach which had not yet yielded promising results. One of these dealt with methods of increasing the work-hardening rate of the rail steel with the thought that such a procedure would prevent the formation of a lip of flowed metal on the gage side of the rail. Tests were also conducted with shot-peening to determine how much of an increase of surface hardness could be obtained and to what depth this work-hardened surface layer might exten. Neither of these lines of approach produced encouraging results.

Another test described by Mr. Manning was one carried out on the Pennsylvania in which alternate rails in the high side of a 6-deg. curve were ground on their gage sides sufficiently often to prevent the formation of any conspicuous lip of metal. This test is still under way. For the first two months, said Mr. Manning, it was necessary to grind the rails every two weeks, but at the end of two months, work hardening had occurred in the surface of the rail to the extent that less frequent grinding was required.

A test that is to be carried out on the Norfolk & Western was also described by Mr. Manning. In this test one group of twelve rails will be of standard specifications and serve as a control. A second group of twelve rails will be planned before being put into service so that the contour of the rail heads will match the average contour of the wheels.

COMMITTEE REPORTS SUBMITTED TO THE A. R. E. A. CONVENTION

Digests of recommendations or actions of 21 groups dealing with 97 subjects of major importance to railroad engineering and maintenance officers

Committee on Ties

C. D. Turley, Chairman*

Progress reports on four of its eight assignments were submitted by the committee. Three of these reports—extent of adherence to specifications, tie renewals and costs per mile of maintained track, and dimensions of ties, were presented as information, while the other report—Revision of Manual—was presented for adoption.

Revision of Manual—The committee made a further study of its chapter in the Manual, and submitted for reapproval without change the following material: Specifications for Machining Crossties; Traffic Unit for Use in Comparing Crosstie Life; Best Practice for Tie Renewals; and Specifications for Dating Nails.

These recommendations of the committee were approved by the convention.

Adherence to Specifications—In a report on its usual field inspection to observe the extent of adherence to specifications for ties, the committee stated that it was impressed by the many advantages of handling ties by lift trucks and with the excellent job of stacking being obtained. Such trucks were observed in use at four of the eight treating plants visited. Although not all seasoning yards have reverted fully to prewar practices and stocks of ties, the committee was greatly encouraged by the improvements made and by the apparent general effort of all the roads to correct conditions as rapidly as possible.

Tie Renewal Record—In a report on tie renewals and costs per mile of maintained track the committee directed attention to tabulations of these figures in a mid-year bulletin. Decreased tie replacements were attributed by the committee to a shortage of track labor, and increased labor costs without corresponding increase in freight and passenger rates. It noted that the rise in the cost of ties, which began in 1941, continued through 1946.

Dimensions of Ties—In a progress report on this subject the committee reviewed its 1939 analysis of the functions of the crosstie, which resulted in its recommendation for the adoption of the 9-ft. tie for 1941 (adopted for the Manual in 1942). Included in this year's report were statements by G. W. Harris, chief engineer system, Atchison, Topeka & Santa Fe, and R. S. Groover, chief engineer, Atlantic Coast Line, on the use of the 9-ft. crosstie on their respective lines. The 9-ft. tie was adopted as standard on the Santa Fe in 1938 and on the Atlantic Coast Line in 1941.

The committee presented a discussion for and against the change to longer ties, in which it pointed out that the greater track support given by longer ties for a given yardage of ballast, and the decrease in the untamped (and thus wasted) ballast at the center of the tie to prevent center-bound track, outweigh the increased cost of the longer tie, which is less, it said, than might at first be assumed, and the ragged appearance of track with a mixture of long and short ties during the transition period.

In view of the experience with the 9-ft. tie as reported by the two railroads, and of the information brought out in its discussion, the committee reaffirmed its recommendations as to length now appearing in the Manual.

**Engineer of Ties and Treatment, Illinois Central*

Location-Operation

F. N. Nye, Chairman*

This committee submitted reports on five of its eight assignments, including Revision of Manual, of which four were progress reports presented as information, while the fifth was a final report, also presented as information.

Revision of Manual—In a progress report on this subject, the committee stated that it plans to collaborate with the Mechanical division, A.A.R., in revising the section of the Manual devoted to "Power" in order that the Engineering and Mechanical divisions can more nearly agree on methods for computing locomotive characteristics.

The committee also stated that the report on track capacity and train performance, which it submitted last year as information, is being prepared for inclusion in the Manual under the heading "III Economics of Railway Operation." Before inclusion of the new section, however, the committee decided to show the application to practical railway problems of some of the principles discussed in the report, and to this end prepared and presented in this year's report an exhibit designed to show the application of the theory of train performance to actual cases; to record actual performances to test the soundness of the theory; and to point out some of the steps that can be taken to extend and refine the theory.

An attempt is now being made to develop other exhibits in which the conditions do not vary over such a wide range, in order to demonstrate more conclusively how closely the theory applies in practice.

Methods for the Solution of Special Problems—Under this assignment, the committee, believing that a report on a comprehensive modernization program for an entire railway would be of unusual interest to A.R.E.A. members, presented as information a study of the renaissance of the Chicago, Indianapolis & Louisville (Monon). According to this study, since this railway was reorganized on May 1, 1946, the new management has undertaken an ambitious improvement program for rebuilding and modernizing the plant. These improvements contemplate complete Dieselization of train service; new passenger and freight cars; a new and heavier track structure and extensive line changes; respacing automatic block signals and adding C.T.C.; and improved communication facilities.

The committee stated in its report that approximately $26 million were authorized for expenditure during 1947, 1948 and 1949, for which $16 million are for equipment and $10 million for line and roadway improvements. An additional $24 million may be spent in the following two years to round out the program.

Following a general account of the Monon's plans, which covers a description of the railway, with data relative to its average daily traffic, and reference to the motive power, equipment and roadway programs involved, the committee pointed out that the programs

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as a whole contemplated improved service to the shippers and traveling public; increased freight and passenger train speeds; heavier train loading; fewer and longer sidings with long turnouts; improved track structure, curve revisions and grade reductions; modern stations and improved roadway buildings; improved signaling and increased grade crossing protection; and improved telephone service.

The committee stated that it intends to follow this matter further and to report in succeeding years the results of this program.

Electrification and Development of Modern Power Units—In a progress report on this subject, the committee, collaborating with the Electrical section, Engineering division, and the Mechanical division, A.A.R., submitted as information a compilation and discussion of information submitted by a group of railways, consisting of comparative data on repair costs for steam and Diesel motive power. Percentage increases in locomotive repair costs were derived for steam and Diesel power in passenger, freight and switching service, and were tabulated for comparison, showing the average of the steam and Diesel locomotives in each class of service.

As has been true with all steam and Diesel data made available to the committee, it was necessary to compare relatively new Diesel locomotives with older steam power. However, the committee believes that, while there is discrepancy in the ages of the locomotives, the comparison covers the actual motive power being used by the railways at this time, so that a policy may be established and decisions reached based on the showing made in current practice.

Cost of Railway Transportation and Operation—In a progress report on its assignment to study the general course of the cost of railway transportation over the past 100 years, including the principal determining elements and their economic significance, the committee, realizing the impracticability of fully developing the assignment because of its vast proportions, submitted as information a condensed report touching briefly on the different phases of the subject as assigned. The committee's report included an outline of the subject, which it called a practical reinstatement of the title; a number of charts and tables presenting data compiled in the course of the study; and a list of 13 ways by which the railroad "may increase the volume of business, effect operating economies and thereby control or reduce expenses". These are as follows: (1) Consolidations of railroads; (2) consolidations of terminal facilities; (3) integrating railroad operation with the operation of other transportation agencies; (4) retirement of lines operated at a loss; (5) elimination of intermediate yard switching, and running more through trains; (6) increasing average daily car, engine and train mileage; (7) increasing average daily ton-miles per car; (8) increasing fuel economy; (9) increasing operating efficiency through the modernizing and improving of facilities, and the purchase of necessary additional facilities and shipment; (10) helping to locate and develop industries along the line; (11) providing traffic incentives or services designed to effect the use of the railroad to ultimate capacity; (12) encouraging legislation to provide for equal and equitable treatment of transportation agencies; and (13) reduction of fixed charges.

Coordinated Highway Service—In a final report on its assignment on coordinated highway service and its effect on the economics of railway operation, the committee submitted as information excerpts from a report entitled "Transport Coordination in the United States", by P. Harvey Middleton, executive vice-president, Railway Business Association. Mr. Middleton's report supplemented the report of the A.A.R. Subcommittee on Highway Motor Transport, excerpts from which were presented in the committee's report last year.

The excerpt from Mr. Middleton's report, endorsed by the committee, consisted of a general description of the development of rail-motor operations, followed by a brief description of coordinated transport services now in operation on a number of major railroads.

In conclusion the committee presented excerpts from an A.A.R. statement made on June 20, 1946, to the House Committee on Interstate and Foreign Commerce in regard to the National Transportation Inquiry undertaken by that Congressional committee. The excerpts, endorsed by the committee, consisted of a digest of that part of the A.A.R. statement dealing with the furtherance of coordination, and federal aid to transportation.

Cooperation With Universities

F. R. Layng, Chairman*

This committee submitted a progress report on each of its four assignments.

Appreciation of University Training—The first assignment of the committee was to stimulate greater appreciation on the part of railway managements of (a) the importance of bringing into the service selected graduates of colleges and universities, and (b) the necessity of providing adequate means for recruiting such graduates and of retaining them in the service by establishing suitable programs for training and advancement.

Supplementing last year's report on this assignment, which reviewed past employment practices of railroads and emphasized the present need for employment of carefully selected engineering graduates, the report this year discusses the response to questionnaires submitted by the committee to ascertain pertinent information as to methods now being employed to interest prospective engineering employees in railroad service, and the salaries being paid to graduates by railroads and other industries.

A questionnaire was submitted to all railroads operating more than 500 mi. of road, and although replies were received from 45 roads, only 33 had hired young engineering graduates during 1946 and 1947. The report points out that, of the 130 graduates employed by these roads in 1946, approximately one-third left the service after working a relatively short period, averaging approximately one year. In commenting on this fact, the committee stated as follows: "This, in a very striking manner, calls attention to one of the serious problems faced by the railroads in recruiting engineering graduates. It also raises some interesting questions as to why there should be such a heavy turnover of newly employed graduates, where the fault lies, and how it can be remedied.

It shows clearly that there is not only the problem of recruiting the graduate, but of retaining him in service after he is once employed."

Four tables were presented by the committee summarizing the information received in response to this questionnaire. One table contains the number and salaries of engineering graduates employed by railroads in 1946 and from January to July, 1947; a second lists the methods used by railroads in recruiting engineering graduates; a third presents information received from seven railroads regarding their programs for salary advancement; and a fourth table summarizes the reasons given for the inability of railroads to employ and retain engineering graduates.

In addition to the summary in the last-mentioned table, the committee quoted highly pertinent comments on this subject received from the chief engineers of five different railroads, and from the assistant chief engineer of another railroad.

A second questionnaire was submitted to and answered by 62 engineering colleges and universities. Of this number, however, only 53 gave the information requested in such shape that it could be tabulated. This information the committee presented in a fifth table, which shows the number and salaries of all civil engineers graduating in the first seven months of 1946, including those employed by railroads. In discussing the response to this questionnaire, the committee stated that the average starting railroad salary was practically the same as the average of all the civil engineering graduates reported, but that a comparison of the maximum salaries indicates that the higher salaries were paid by industry generally

Vice-President and Chief Engineer, Bessemer & Lake Erie.

and not by the railroads. However, it pointed out that the information furnished on railroad employment covered such a small sampling that any conclusions from the college questionnaire as to salaries paid graduates entering railroad service might be misleading. Supplementing its own comments and summaries, the committee quoted representative remarks on the general subject by six colleges, many of which are very revealing of the attitude of the colleges and their graduates toward railroad employment.

Stimulate Greater Interest—The committee's second assignment was to stimulate among college and university students a greater interest in the science of transportation and its importance in the national economic structure by cooperating with and contributing to the activities of student organizations in colleges and universities.

The report states that the activities of the committee during the past year were largely concentrated on making arrangements to have railroad speakers appear before student groups. As a result of these activities, it says, 18 institutions expressed an interest in having speakers sent to them, and to date speakers have appeared before the student chapters of the American Society of Civil Engineers in 13 institutions. The committee expressed the hope that during the present winter and coming summer it might place speakers in the remainder of the schools that showed an interest; also that it might interest more schools. Listed in the report are the schools at which appearances were made, the speakers, and a brief resume of the subject discussed.

Cooperative Education—In past reports the committee called attention to the value of the cooperative system of education for railway service and last year presented a comprehensive statement of what is meant by cooperative education, its ideals and objectives. It had expected to be able to present this year a summary of the degree to which railroads are now participating in such education, but said a report at this time would not be significant because the schools have not yet been able to return to normal, or prewar, operation.

The committee emphasized that cooperative education is but one method of providing concurrent education and experience during the formative period in the lives of young engineers. Summer employment of engineering students and faculty members during vacation periods is regarded as being mutually beneficial to the railway industry and education.

The situation regarding the supply and demand of engineering graduates is being studied, the committee stated, by the Manpower committee of the American Society for Engineering Education, and a report will be published during the winter or early spring which should be of interest to A.R.E.A. members.

Investigate Textbooks—On its assignment to investigate textbooks and other material available for instruction in railway engineering and make pertinent comment thereon, the committee submitted a bibliography—with descriptive comment—of material now available. In commenting on the suggestion sometimes made by colleges that railway groups, such as the A.R.E.A., should indicate what should be included in courses in railway engineering, the committee stated that it seems impracticable to attempt to outline the contents of a course that would be applicable to all colleges. Railway engineering officers do not agree on how far the colleges should go in presenting detailed material.

Committee on Impact

A. B. Chapman, Chairman*

The committee submitted progress reports on eight of its eleven assignments and a final report on one, all of which discuss tests carried out during the past year.

Viaduct Columns—This report discusses the measurement of strains in the columns and bracing of three viaducts supporting short truss and girder spans.

The analysis of this data, it states, indicates that, while the impact effects are small, the bending stresses in the columns are quite high; also, that several of the columns are bearing on one edge or on one corner.

Steel Girder Spans—Of data secured on several girder spans tested during the past season, the six highest recorded impacts—under rolling equipment with hammer blow, and under rolling equipment without hammer blow—can be found, this report states, in the current report of the Committee on Iron and Steel Structures.

Dynamic Shear—On its assignment on tests of dynamic shear in steel girders and truss spans, the committee reported progress in assembling data, and said that measurements of dynamic shear in the girder web plates have been made.

Columns and Hangers—The committee reported progress in assembling and analysing data resulting from measurements of the static and live-load stresses in the floorbeam hangers of a through truss span on the Illinois Central by the research staff of the A.A.R., collaborating with Purdue University.

Damping Factors—On its assignment to determine the damping factors of steel spans and the variation in amount of damping with change in loading, by means of an oscillator and model tests, the committee stated that its report on investigation of bridge impacts with such a mechanical oscillator, presented in the June-July, 1947, bulletin, is the final report by the committee on this subject—it being the conclusion of the committee that this method of determining the amount of impact in railroad bridges is not satisfactory.

Timber Stringer Bridges—This report states that stresses in the stringers of both an open-deck and a ballasted-deck trestle, and also in the deck timbers of several open and ballasted girder spans, were measured during the past year. It says that progress is being made in the analysis of the assembled data.

Steel Truss Spans—Under this assignment the committee referred briefly to a report of the investigation of impacts and bending stresses in two truss spans on the Toledo Terminal, presented in the September-October, 1947, bulletin.

Distribution of Live Load—This report discusses tests made on the transverse floorbeams of a 100-ft., ballasted-deck, through-girder span of modern design on the Burlington, carried out during the summer of 1947 under the general direction of G. M. Magee, research engineer, Engineering division, A.A.R., with E. J. Ruble, structural engineer, research staff, A.A.R., in direct charge. It includes a detailed description of the instruments and procedure employed, and illustrates the results by diagrams. From the data found in these tests the committee concluded:

(1) that the locomotive axle loads are not distributed equally to the floorbeams; and (2) that there is good agreement between the average of the maximum stresses recorded in the floorbeams and the calculated stresses as determined by the A.R.E.A. design specifications.

Stresses in Lateral Bracing—Under this assignment the committee reported progress in assembling data on this subject, and stated that the test data thus far analyzed indicate that the stresses in lateral frames are small, but that these members are subject to considerable vibration.

*Assistant Chief Engineer, Lines East, Milwaukee

Uniform General Contract Forms

W. R. Swatosh, Chairman*

The committee submitted reports on all of its four assignments. These reports included one on Revision of Manual, two final reports submitted for adoption and printing in the Manual, and one progress report presented as information.

Revision of Manual—The committee recommended reapproval of the Joint Passenger Terminal Agreement with revisions of Article 802—Reserve for Retirement; Article 803—Insurance; and

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Article 1005—Payment in Legal Tender. It recommended that the agreement for Cab Stand and Baggage Transfer Privileges be reapproved with the addition of a new clause entitled 'Independent Contractor"; and it recommended that the agreement for Joint Use of Passenger Station Facilities be reapproved without change. All recommendations were approved.

Minor Construction Contracts—Under this assignment the committee recommended for adoption and publication in the Manual, a form of construction contract for minor projects, a tentative draft of which was presented as information by the committee last year for comment and criticism.

Flood Control Construction Agreement—Because of the current need for a form of agreement for construction of stop log or other structures for flood control, the committee presented a draft of such a form and recommended it be adopted and published in the Manual.

Agreement for Subsurface Exploration on Railway Right of Way—Since the Manual, at the present time, does not contain a form of agreement to permit subsurface exploration by state or other government agencies on railway rights of way, the committee drafted and presented such a form of agreement which it believes will fulfill the railways' requirements. Criticisms and suggestions were requested.

Report on Rail

C. B. Bronson, Chairman*

This committee reported in detail on 11 of 12 assignments having to do with rail and related subjects.

Revision of Manual—Under this assignment the committee recommended for reapproval without change the following items in the Manual: 90-lb. RA-A and 100-lb. RE Rail Sections; and Joint Bars for 90-lb. RA-A and 100-lb. RE Rail. It recommended changes in the following items: Application of Welded Bonds; Specifications for Spring Washers; Rail Failure Forms 402-C, 402-C (a) and 402-L. It also recommended an addition — Transverse Defect — to both the Glossary of the Manual and to the description of rail failures on Form 402-A.

All these recommendations were adopted by the convention.

On recommendation of the committee and with the approval of the Board of Direction, a letter ballot was issued to the membership on November 1, 1947, submitting for adoption a rail drilling and joint-bar spacing for 115-lb., 132-lb. and 133-lb. RE rail sections. The letter of transmittal, the ballot and the report of the tellers are reproduced in this report. The report of the tellers shows that 685 voting members were in favor while 46 were opposed.

Rail Failure Statistics—Under this assignment the committee presented in tables and charts statistics on rail failures reported to December 31, 1946. It pointed out that service failures in 1946 due to transverse fissures were by far the lowest that have been reported in the last 21 years. This result, it stated, can be attributed to continued detector car testing and to the increasing percentage of control-cooled rail in track.

In commenting on a table showing the combined service and detected failure rates of all types of failures of rails rolled in 1933 to 1945, the committee called attention to the marked decrease in failures starting with the 1937 rolling when purchase of control-cooled rail first exceeded those of open-hearth rail.

Hardening Rail Ends—Under its assignment on methods of hardening rail ends and reconditioning them to control rail battering, the committee submitted a report on measurements of profile and batter of rail ends, with the recommendation that a part thereof be adopted and published in the Manual. It recommended that the matter appearing under the heading Rail Batter on Manual Pages 4-52 to 4-54, inclusive, be withdrawn. The material prepared by the committee to be substituted therefore consisted of a statement under the heading Measurement of Profile and Batter of Rail. Included with the statement are drawings showing the proposed profile gage, batter gage and the method of using the batter gage.

All the recommendations in connection with this subject were approved.

Continuous Welded Rail—Collaborating with the Committee on Track, the committee presented in summarized form statements showing the installations of continuous welded rail. The statements were revised this year by eliminating those with the older types of welding.

Service Tests of Joint Bars—The committee presented a final report of the service tests of various designs of joint bars for 112 and 131-lb. RE rail which were installed on tangent track on the Atchison, Topeka & Santa Fe and on the Pennsylvania in 1937. The following conclusions were offered: (1) The performance of all the various types of joints on the end-hardened rails is outstandingly superior to that on unhardened rails. (2) The low rates of railhead wear shown in the tests mean that these rails would not have to be removed from tangent track because of rail-head wear for many years. (3) As compared to 24-in. bars, the 36-in. bars will have a substantially longer service life, maintain a better track surface at the joints, and prolong the life of the rail itself. (4) The performance of full-bearing head-contact bars has been equal to or better than the controlled-bearing head and base bars of similar design. (5) The performance of head-free bars is as good as that of head-contact bars of comparable section and length. (6) In general the short toe designs of bar are giving equal or superior performance. (7) In the Pennsylvania installation the relatively light-weight F-4 bar gave fully as good or better performance than the other much heavier bars. (8) The special types of joints included in the tests have not given as good service as the conventional types of rail joints.

Joint Bar Wear and Failures—On its assignment to study joint bar wear and failures, including revision of design and specification for new bars and bars for maintenance repairs, the committee presented the sixth progress report of the rolling-load tests of joint bars which are being conducted at the University of Illinois under the direction of R. S. Jensen, special research associate of engineering materials at the University. The report, which was prepared by Mr. Jensen, included detailed descriptions of the procedure used in the tests, and the results of rolling-load and hardness tests on a number of different joint bars. Appended to the report were six conclusions.

Corrugated Rail— Under its assignment to study the causes and remedy of corrugated rail and effect of corrugated rail upon the riding qualities of tracks and upon the costs of track and equipment maintenance, the committee presented a paper entitled Third Progress Report on Corrugated Rails, by R. E. Cramer, special research associate professor of engineering materials, University of Illinois. The committee also presented extracts from a letter written to Professor Cramer by E. Bennett, civil engineer, New South Wales Railway, Sydney, Australia, setting forth a theory in regard to slippage of wheels under cars; and an account of the formation and later disappearance of corrugation on a branch line of the Canadian National, received from Barton Wheelwright, chief engineer.

Fractures Under Engine Burns—Under this assignment the committee presented a progress report of the rolling-load tests on engine-burned rails being conducted at the Southern Railway Laboratory at Alexandria, Va. Since the 1947 report, 32 additional specimens were tested, and the results are given in tabular form. According to the report, the test results, although limited, would appear to indicate a definite increase in fatigue life of engine-burned rails which have been well-repaired, as compared to unrepaired engine-burned rails.

Shelly Spots and Head Checks—The committee presented a progress report on its assignment to study the causes of shelly spots and head checks in rail surfaces with a view to developing measures for their prevention, to which were appended an account of a field investigation by the Engineering division research staff; a sixth progress report of the shelly rail studies at the University of Illinois; and a report on shelly rail studies at the Battelle Memorial Institute.

The committee stated that it has been unable as yet to find a solution to the problem of shelly rail, but that the most promising developments so far appear to be three per cent chrome steel, the modified head contours and

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heat-treated rail. The committee had the following comments to make: A study of data indicates no definite relationship between the chemistry and shelling except insofar as the hardness of the running surface is affected; a study of data as to curvature, elevations, speeds and grades reveals no definite trends; the use of lubricators has no definite effect; transposing shelly high rails to the low rail is well worth while if done in time; rail slow-cold-worked under traffic in non-shelling locations and relaid in shelling locations possesses little if any greater resistance to shelling than ordinary rail.

The report of the Engineering division research staff dealt with a newly-designed rail-head contour which will soon be tested to obtain further data on the shelling problem. The report on shelly rail tests at the University of Illinois, which was prepared by R. E. Cramer, special research associate professor, gives results of rolling loads tests on 18 more rails to supplement the data on 25 rails which has been presented in previous reports. This report concludes: (1) Only one kind of alloy rail, the three-per cent chromium, has given high test results. (2) Both carbon-steel rails and certain low-alloy rails have given high results in the heat-treated condition.

The report on shelly rail studies by H. A. Black and G. K. Manning of the Battelle Memorial Institute states that metalographic work was directed toward determining the origin of the shelly cracks and searching for abnormal defects in the steel. Also spectrographic analysis was made to determine the amount of 13 different residual elements present in each rail tested. The information developed in this report is illustrated by tables, graphs and photographs.

Developments in Rail Design—Appended to the report on this assignment are the results of laboratory and service tests carried out by the Engineering division research staff on the effect of bolt spacing on rail web stresses within the rail joint. As a result of these studies, the committee said, recommendation has been made for the adoption of revised bolt hole spacing for 24-in. and 36-in. joints.

In another appendix, the results of fatigue tests of rail webs conducted at the University of Illinois are presented. In this test, the work consisted primarily of a test of certain corrosion-resistive coatings.

Fourteenth Progress Report on Rail Failures—Also appended to the report of the Committee on Rail is the Fourteenth Progress Report of the Cooperative Investigation of Failures in Railroad Rails in Service and Their Prevention, which is being conducted by the Engineering Experiment Station, University of Illinois, in cooperation with the Association of American Railroads and the American Iron & Steel Institute. Prepared by Professor Cramer this report deals with the examination and classification of 42 controlled-cooled rails which had failed in service. Of these, 20 rails were found to contain transverse fissures from "hot-torn steel."

According to the report the mills now feel certain that the cause of this condition is a tearing of the steel during rolling when a portion of the rail bloom has been reheated to a point where it is too hot for successful rolling. The terms "hot tear" or "hot-torn steel" are standard mill terms for this defect and it was recommended that they be used to indicate the cause of such rail failures. A majority of the 20 rails which developed hot tears the past year were rolled before the cause of this defect was recognized in 1943. The fact that so few transverse fissures have been discovered in more than eight million tons of control-cooled rails rolled between 1935 and 1944 is certainly a demonstration, the report states, of the improvement effected since control cooling was developed.

In discussing failures in end-hardened rail due to heat checks produced by the heat from grinding wheels, the report states that such failures occur quite frequently on rails which were quenched with water during the end-hardening process. For this reason, it was said, water quenching is not recommended. In connection with failed rails built up by welding, the report states that cracks can be expected to develop in weld metal deposited on a cold rail by the arc-welding process. If the arc-welding is preceded by sufficient preheating of the rail and followed by post heating or slow cooling, it is possible to prevent such shrinkage cracks.

Yards and Terminals

G. F. Hand, Chairman*

The committee submitted reports on five of its eight assignments, including a report with recommendations under Revision of Manual and four progress reports.

Revision of Manual—Under this assignment the committee recommended revisions or readoption of those portions of Chapter 14 of the Manual in which no changes have been made subsequent to 1936. These recommendations were adopted.

Classification Yards—Collaborating with the Committee on Economics of Railway Location and Operation, the committee submitted as information a progress report dealing with methods of marking switches. It noted that information concerning this subject, gathered from 23 different railroads, indicates that, on a large percentage of the roads, some method of identifying switches in yards has been attempted. Also indicated, it said, is a definite necessity and trend toward a permanent, method of numbering switches.

Various methods now in use on different railroads for identifying switches were described and illustrated. In conclusion, the committee stated that many roads have found it advantageous to mark switches in yards with numbers. Such number should be clear and easily read at a glance; and serious consideration should be given to the use of reflector-type numerals for this purpose where much night switching is done. According to the committee each road should adopt the method best suited to its particular conditions.

Pertinent Subjects Bibliography—The annual bibliography on subjects pertaining to yards and terminals appearing in current periodicals was presented as information in a progress report. The bibliography also listed recent literature in book form relating to this subject.

Locomotive Terminal Facilities—A progress report was presented, as information, on the terminal facilities required for Diesel-electric locomotives. In a general discussion of this subject, the committee pointed out that existing terminal facilities for steam locomotives are inadequate to service the increasing number of Diesel locomotives being added to locomotive fleets. Because of their lengths and type of construction, it said, new shop facilities must be provided, or existing steam locomotive shop facilities be remodeled or reconstructed to service them.

The report presents the considerations to be given attention in providing such facilities, discussing these under the following headings: Location and general layout; Diesel shop-building facilities for running and heavy repairs; fuel oil facilities; sanding facilities; locomotive washing facilities; and store room for Diesel parts.

Mechanical Handling of L.C.L. Freight—Under its assignmnt on facilities for mechanical handling of l.c.l. freight at freighthouses, collaborating with the Committee on Buildings, the committee presented as information a progress report dealing with conveyor handling. Other mechanical means for handling l.c.l. freight at freighthouses will be investigated in a continuation of this subject.

In its report the committee gave an outline description of the continuous conveyors that have been provided at various locations for handling express transfer, including one at the West Side Terminal in New York, another at Jacksonville, Fla., and a third in the Jackson Heights section of New York. The committee also described a mechanized freight station at Birmingham, England, where l.c.l. freight is handled by conveyor, and car-unloading conveyors in use by the London, Midland region of the British Railways, at Derby, England. The committee stated that, to date, no installation for conveyor handling of l.c.l. freight on a

**Assistant to Chief Engineer, New York, New Haven & Hartford*

large scale has been placed in service in the United States.

In conclusion, the committee stated that, in general, it would be difficult to apply and to justify the use, for handling of l.c.l. shipments, of the type of chain conveyor now in use for handling express.

The reason, it said, is that a large amount of tonnage consisting of large or heavy pieces cannot be handled by hand on or off a moving conveyor. Such pieces would require special handling, and a considerable width of freighthouse would then be needed for the conveyor and an alleyway for handling these pieces by hand truck or other means. The committee stated that, although conveyors are satisfactory for handling mail or packages of uniform shape and size, it considers other mechanical devices, such as tractor-trailer operation, fork trucks, palletizing, etc., generally more efficient and economical in handling l.c.l. freight.

Report on Buildings

H. C. Lorenz, Chairman*

This committee presented a progress report as information on one of its eight assignments.

Specifications for Building—In a report on this subject the committe submitted, as information, tentative specifications for timber connectors in railway buildings, and specifications for copper tubing. The specifications for timber connectors dealt with three types: (1) Split rings; (2) toothed rings, and (3) shear plates. In the specifications for copper tubing the material was presented under the following headings: General material, use classification, workmanship, manufacturers markings, pipe covering, and general conditions. The committee invited comment and criticism on both specifications.

**Assistant Engineer, Cleveland, Cincinnati, Chicago & St. Louis*

Report on Track

E. W. Caruthers, Chairman*

In reporting on six of its nine assignments, the committee covered a variety of subjects dealing with track materials and maintenance practices.

Revision of Manual—Under this assignment the committee submitted for reapproval without change the text now appearing in the Manual under the following headings: Specifications for Soft Steel Cut Track Spikes; Design of Cut Track Spikes; Table of Temperature Expansion for Laying Rail; Oiling Track Fixtures; and Vertical Curves.

Fastenings for Continuous Welded Rail—In a progress report on this subject, presented as information, the committee tabulated the changes in length observed in the action of 1,200 ft. of 131-lb. continuous rail in a test track at New Haven, Conn. This test track, it stated, was connected with an adjacent yard track during August, 1947, and is now used as an outbound departure track. The ballast used on the test track consisted of one-inch stone. According to the committee, the movement could possibly have been decreased materially if graded ballast had been used.

After stating that it is quite apparent that both ends of each continuous rail should be fully anchored to minimize the gap at each end, the committee presented a formula by which the required anchorage may be computed. From this formula, the number of ties on each rail to be anchored is determined by multiplying the product of the temperature range and the area of the rail in square inches by a constant (195), and dividing the result by tie resistance in the ballast.

In discussing this formula, the committee noted that joint restraint, usually a definite and considerable restraining force, has not been considered. The reason, it stated, is that the magnitude of joint restraint is difficult to determine and that it would seem advisable to anchor the rail for total computed stress, with joint restraint to be used as an indefinite safety factor.

As to the value of tie resistance, the committee stated that there seems to be little reliable data, particularly with respect to various types of ballast. The value generally accepted, it said, lies between 500 lb. and 800 lb. per tie per rail. Recent tests on the New York, New Haven & Hartford developed figures for tie resistance ranging from 1050 to 1400 lb. with stone ballast. Further tests will be conducted in both stone and gravel-ballasted track, according to the committee.

In discussing the temperature range to be used in the formula, the committee stated that it may be well to consider the fact that, in portions of the country where ballast freezes during winter, tie resistance is at least doubled, and in territory where freezing does not occur, temperature ranges are not excessive. Therefore, it stated, it would seem unnecessary to use a range in excess of 70 deg.

As to intermediate anchorage, the amount will depend, said the committee, on the gap which one is willing to permit in case of a break. Should jointed rail be used adjoining welded rail, it should be anchored at the end in a manner similar to the welded rail, to minimize the push or drag on the latter.

Inspection of continuous rail installations where various types of fastenings are used, including the GEO plate, M & L plate, and the conventional double-shoulder plate with cut spikes indicates, according to the committee, that all are suitable for welded rail.

Switches, Frogs, Crossings, Etc.—Under its assignment to study plans for switches, frogs, crossings, and spring and slip switches, collaborating with the Signal Section, A.A.R., the committee recommended a number of changes in that part of the Manual dealing with Manganese Steel Track Castings. The Standardization committee of the Manganese Track Society collaborated with the committee on the preparation of these recommendations, which were adopted.

In an appendix (4-a) to its report the committee presented "A Study of Guarding the Center Frogs in Small Angle Crossings", by G. A. Magee research engineer, Engineering Division, A.A.R. In this study Mr. Magee pointed out that where rigid frogs are used in crossings of small intersection angles, the wheel can only be held away from the facing frog point by the back of the mating wheel contacting the inner face of the flangeway of the opposite frog. He showed that when the intersection angle is 17 deg. 26 min. or more, the wheel will be perfectly guarded at the facing point frog by the mating wheel contact in the opposite flangeway. However, he said, it is obvious that a length along the wheel can be depended upon guarding the point so that angles smaller than 17 deg. 26 min. may be safely used, and he presented a formula by which the angle may be determined for any length guarded by the wheel flange. The guarding length that can be safely depended upon, however, is the important determining factor and Mr. Magee derived other formulas by which this guarding length may be determined. Also he computed the intersection angles for various rates of curvature and plotted their values on a reproduction of Plan 820-46. He recommended that these values be given consideration in any revision of the plan.

In another appendix (4-b)—entitled A Progress Report on the Performance of Solid Manganese Crossing Frogs and Special Frog Support—the committee described the performance of a frog of the new Taylor-Wharton design, which after completing a one-year service test, was removed for observation on May 26, 1947. The service performance of other designs will be reported next year, according to the committee.

In a third appendix (4-c)—entitled A Progress Report on Fatigue Tests of Manganese Steel—the committee stated that, in an investigation of the cause of the development of flangeway cracks in manganese frogs, stresses were measured in actual service to determine the range of repeated stress to which the steel is subjected. Since little information is available on the fatigue strength of Hadfield manganese steel for the particular fatigue range found in these measurements, the committee decided to make laboratory fatigue tests to develop this information. Such tests, it stated, are being made at the University of Illinois, the results of which will be presented in next year's report.

Stresses in Tie Plates—Collaborating with the committees on Ties and Rail, the committee presented a report embracing material for adoption and publication in the Manual as a substitution for material now appearing therein. To

**Assistant Engineer, Pennsylvania*

clarify the language of the Specifications for Soft and Medium Steel Tie Plates, the committee prepared a redraft of these specificatios under the title, "Low Carbon Steel Tie Plates", for adoption and publication in the Manual. For the same reason a new draft has been prepared for the Specifications for Hot-Worked, High-Carbon Steel Tie Plates, and was submitted for adoption and publication in the Manual to replace the present specifications bearing the same title. The changes in these two specifications are presented in detail in the report. The committee's recommendations were adopted.

After a review of last year's report, which presented a brief account of the cooperative effort with the American Iron and Steel Institute to develop designs of tie plates that would meet the railroads' requirements and reduce the number of designs now being produced, and which also included plans for 15 tie plates that had been developed by the institute, the committee stated that since that time some of the designs had been altered and three others added. All 18 designs appear in this year's report. In the opinion of the committee, 13 of these plans will meet the requirements of the railroads more adequately than the designs now in the Manual, and it therefore recommended their adoption for publication in the Manual in substitution for those designs now appearing on Pages 5-4 to 5-86 inclusive. After considerable discussion the committee's recommendations were adopted.

Hold-Down Fastenings—Under its assignment on hold-down fastenings for tie plates; design, use and economy with respect to minimizing tie wear, the committee, collaborating with the Committee on Ties, presented a further report of progress in tests of such fastenings.

The committee stated that, from data on test installations of hold-down fastenings and from investigations being conducted in connection with another of its assignments—design of and stresses in tie plates—information will be developed that will provide the basis for the determination of the most economical size of the tie plate and the most effective hold-down fastenings from the standpoint of securing maximum utilization of the service life of ties.

The committee described in detail a test installation made on the Louisville & Nashville during 1947. Initial readings for measurement of mechanical wear of ties, variations in track gage, curvature and cross levels were completed in November, 1947. It is proposed to make an inspection each year and when the first progress report is presented a full description of the types of construction will be included.

In connection with a service test installation of several types of hold-down fastenings on the Illinois Central, the first progress report on which was presented last year, the commitee stated that the test data for 1947 showed very little additional mechanical wear of ties, and the results were, therefore, omitted.

Placing of Anti-Creepers—The Committee presented its fourth and final progress report on the assignment to study and submit recommendations on number and placing of anti-creepers for various conditions. Included in this report are recommendations as to number and position of rail anchors for adoption and publication in the Manual. These recommendations, it stated, are based on measurements and observations over a period of four years of three service tests of rail anchoring, including various arrangements of anchors in both crushed rock and gravel ballast, and under both one-way and two-way traffic.

Following a description of these test sections and a brief discussion, with diagrams of the test data developed in each test section, the committee recommended the adoption and publication in the Manual of material to appear under the heading Rail Creepage—Number and Position of Rail Anchors. The recommendation was approved.

Waterproofing

G. E. Robinson, Chairman*

Of its two assignments, this committee submitted a progress report on Revision of the Manual only, recommending minor revisions of the specifications for bituminous emulsions for dampproofing, which appear on pages 29-17 to 29-19 of the Manual. In addition, the committee recommended minor editorial changes in portions of these specifications. The report was received without comment.

**Engineer of structures, New York Central, Lines West of Buffalo.*

Economics of Labor

J. S. McBride, Chairman*

Of its seven assignments, the committee submitted reports on four, one of which was a progress report presented as information. The other three were final reports, also presented as information.

Reduction of Labor Required—On its assignment to analyze the operations of railways that have made marked progress in the reduction of labor required in maintenance-of-way work, the committee presented as information an account of an inspection it had made of welded rail on the Delaware & Hudson.

Included were comparative figures on the number of man-hours required to maintain track with welded rail as compared with conventional track. In making this comparison the committee presented a tabulation showing the man-hours per mile per year, and the man-hours per 1,000 gross tons per mile per year, required for various types of maintenance work on angle-barred track and on welded track.

**Chief Engineer, Chicago & Eastern Illinois*

The committee pointed out that experience on the Delaware & Hudson shows that rail failures, including broken welds, are possibly less frequent where the rail is welded than in similar rail with conventional joints, and that the probability of buckled track presents no greater problem than may be expected on similar jointed track.

In conclusion the committee stated that material savings in maintenance labor, possibly as high as 30 per cent or more, may be obtained through the use of continuous welded rail.

Methods to Offset Increased Costs—A final report on its assignment on new methods and labor-saving equipment to offset increased costs was submitted by the committee as information. This report deals largely with refinements in methods and, since "not many new machines have been produced," in the application of improved machinery. The methods discussed by the committee to accomplish work in a more economical manner, and thereby offset increased costs were: (1) Improved supervision; (2) careful planning and programming of work; (3) applying material at less cost; and (4) use of equipment. In discussing the use of equipment to offset increased costs the committee listed the outstanding developments in such equipment during the year.

Economies from Welded Rail—On its assignment on labor economies derived from continuous welded rail in special locations, the committee submitted a final report as information. The committee noted that the proper maintenance of rail joints has long been a problem, and that a remedy is to eliminate the joints by butt-welding the rails. The practicability of such welding, it said, can be attested by noting the successful installations of welded joints on various railroads. From a study of available cost information the committee stated that the cost of welding and installing long lengths of welded rail "is far from prohibitive, and would be absorbed by longer life in main tracks of the welded rail," and savings in maintenance.

The economies, as listed by the committee, to be derived from the use of welded rail in special locations are as follows: (1) The annual savings for surfacing joints through street and road crossings amounts to 54 man-hours per joint; (2) the annual saving for surfacing in the vicinity of coaling and water stations amounts to 31 man-hours per joint; (3) the annual saving per mile in a tunnel has been given by one road as 360 man-hours per year over a period of three years, and in addition the life of the rail is expected to be extended from 6 years for conventional track to 10 years for all-welded track; and (4) another road, after installing 4.75 mi. of all-welded track in a double-track tunnel in 1942, has estimated a 5-year longer life for the weld-

ed rail as compared to conventional track, and concluded that there will be at least 35 per cent less maintenance due to the welding of the rail joints.

In conclusion the committee stated that: (1) definite labor economies have been obtained by the use of continuous welded rail in special locations, such as street and highway grade crossings, tunnels, station grounds, in the vicinity of coaling and water stations, etc.; and (2) that the labor economies to be obtained will vary with local conditions.

Economies from Safety Precautions—On this assignment—labor economies to be derived by adherence to safety precautions—the committee presented a final report as information.

In this report the discussion was limited to a single aspect of the subject, namely, the effect of accidents upon the productive capacity of the men and equipment, and what can be done to reduce such accidents to a minimum.

After listing the losses that are sustained by not adhering to safety precautions, the committee emphasized the need for educating the supervisor to fully recognize the meaning of safety, and pointed out the safety considerations the supervisor should keep in mind during his association with employees.

Following a discussion of the chief causes of accidents and ideas for arousing interest in safety, the committee concluded its report as follows: "Labor economy will be the natural result of, and in direct proportion to, the practical schooling in safety matters given to supervisors and their men. The educational program must be constant, analytical, and aggressive to be effective. Safety is a selling job and its success depends upon how well supervisory officers know the meaning of good safety practices. Thus, to sell safety they must analyze every operation of every job under their control to determine how each move can be made with safety. This knowledge will enable them to do more than merely tell the men to be careful."

Committee on Masonry

F. R. Smith, Chairman*

This committee submitted reports on three of its nine assignments, covering principles of design, foundations for masonry structures, and methods of designing, constructing and maintaining tunnels.

Principles of Design—Collaborating with nine other standing committees, the committee submitted a report on this assignment which was presented in three parts. The first part contains, for adoption and publication in the Manual, specifications for design of concrete transmission poles, identical to those presented last year for critical review, but on which no comment was received during the year. The second part of the report contains specifications for reinforced concrete cribbing; specifications for metal cribbing; and specifications for timber cribbing. These specifications were presented for critical review with the idea of incorporating them in the Manual next year. In the third part of the report, specifications for reinforced concrete culvert pipe are presented for eventual replacement of specifications now in the Manual.

The specifications for design of concrete transmission poles were approved with the provision that correction will be made of a few minor errors contained in the specifications as published in the proceedings.

Foundations—On its assignment on design and construction of foundations for masonry structures, collaborating with five other standing committees, the committee submitted specifications for pile foundations, employing various types of piles. These specifications, it stated, were presented for comment, with the idea of offering them next year to replace all material now appearing on pages 8-117 to 8-122 in the Manual.

Tunnels—Collaborating with four other committees on methods of designing, constructing and maintaining tunnels, the committee submitted a progress report containing tentative specifications for lining railway tunnels with timber. Intending to offer them next year for adoption and publication as a new section in the Manual, the committee presented them this year for critical review.

*Assistant Chief Engineer, in Charge of Bridges and Buildings, Union Railroad.

Water Service

E. M. Grime, Chairman*

Reports on seven of eight assignments were submitted by this committee, including one on Revision of Manual, five progress reports presented as information, and one final report, also presented as information.

Revision of Manual—Under this assignment the committee recommended minor revisions in material appearing in the Manual under the following headings: General Principles of Water Supply; Specifications for Laying Cast Iron Pipe; Lime Soda Method; and Water for Drinking Purposes. It also recommended for reapproval without change the material under 12 other headings in the Manual. These recommendations were approved.

Corrosion of Steam Boilers—On its assignment to investigate intercrystalline and other types of corrosion of steam boilers, the committee offered a progress report, which presents in detail the procedure in the construction of the all-welded boiler. This information was developed by an investigation made during the year by the committee in collaboration with a committee of the Master Boiler Makers Association, which had been assigned to make a study of this type of locomotive boiler fabrication. The committee pointed out that a number of all-welded boilers are now in service on various railroads, and that one had previously been used on an eastern railroad for some 10 years.

From the information developed in its investigation, the committee stated (with due acknowledgment to the Master Boiler Makers Association), that fabrication by welding should result in a very satisfactory boiler, free of the possibility of any seams that facilitate concentrations of dissolved solids which contribute to intercrystalline corrosion.

Governmental Regulations Pertaining to Railway Sanitation—The committee, collaborating with the Joint Committee on Railway Sanitation, A.A.R., submitted a progress report, as information, on this subject. It announced that the first phase of the Sanitation Research Project of the A.A.R.—studies on quantities and nature of discharges, and of passenger toilet-use habits—has practically been completed. The object of this project is to study the handling and disposal of toilet wastes from passenger-carrying railroad cars. Completion of the first phase, the committee pointed out, will enable the project personnel to engage in the design of equipment for the handling and disposal of such wastes. Three broad methods, it stated, are under study and design: (1) That of maceration, holding and discharge under controlled conditions, with and without disinfecton; (2) simple retention in a holding device for disposal at terminals; and (3) the separation of liquids and solids, with discharge of the liquid and retention of the small percentage of solid matter for terminal disposal. At present the emphasis is on the first of these methods.

The committee pointed out that the new Interstate Quarantine Regulations promulgated by the Federal Security Agency, Public Health Service, became effective on June 16, 1947, and urged that these new regulations be examined critically by operating, mechanical and engineerng officers of the railroads, since there are new requirements of considerable importance involving submission to federal and state authorities, where sanitation is involved, of plans for terminal, new passenger and dining-car facilities and equipment, as well as requirements in the certification of water for drinking and culinary purposes, quality of food served passengers, etc.

Sanitation Practices As Applied to Camp Cars and Bunk Houses—On this subject—a new assignment—the committee submitted a progress report concerning camp cars only. From data furnished by the A.R.E.A. membership, the committee found that approximately 90,000 of the more than 300,000 maintenance-of-way employees of Class I railroads are required by the nature of their work to live in camp cars, and that more than 18,000 cars are used for this purpose.

*Engineer Water Service (retired), Northern Pacific

The committee discussed in detail various phases of sanitation involved in the construction and operation of camp cars, under the following headings: General; Living and Recreation Space Requirements; Heating, Ventilation and Lighting; Drinking Water; Washing and Bathing; Kitchen and Dining-Car Facilities; Waste Disposal; Toilet Facilities; Insect Control; and Sanitary Control. Under the last named heading, the committee stated that, from information received, it appears that there are few roads that now have a comprehensive sanitary-control program.

It suggested, therefore, "that for efficient sanitary control work, a definite policy must be adopted. The initial step could be the publication of a circular in which departmental responsibilities from top to bottom are noted and in which the rules of sanitation for camp cars are set up for specific application".

Silica Scale Prevention—Under this assignment the committee submitted a progress report on the economies of silica-scale prevention, including a review of the processes developed for silica removal from boiler water, as presented by the committee in 1941.

Following a general discussion which covered the reasons why scale formations should be avoided in both low-pressure and high-pressure boilers, and some of the conditions which cause such scale to form, the committee stated that the economies for silica removal based on operating conditions seem to depend upon the following: (1) Overheating of firebox side sheets due to thin silica scale occurring on long engine runs with lengthened washout periods and boiler pressures over 250 lb. on territories of natural low hardness and on those where treated water is used; (2) reduction of silica as a means of reducing embrittlement tendencies in treated waters; (3) prevention of silica scale deposits in flash boilers; (4) prevention of silica scale in high-pressure stationary boilers; and (5) use of steam turbine locomotives which require the removal of silica deposit from the turbine blades.

The committee discussed three newly-developed processes for silica removal —by compression distillation; by rusting iron in the form of cast iron wheel borings in the presence of the water to be treated; and by applying the principles of demineralizing to the removal of silica from raw boiler feedwater.

The report was concluded as follows: "The amount of soluble silica which may be present in boiler water varies. The most general rule is that the higher the boiler pressures the lower the silica content in the boiler water must be. The methods of solution and the economies will depend upon the individual conditions encountered".

Washing Passenger Train Cars—In a final report, submitted as information, on its assignment to determine requisites of water and wetting agents used in washing passenger train cars, the committee assumed that the washing of passenger-train equipment will be done by mechanical washers. Following some statements concerning the general properties of wetting agents, the committee presented a chemical analysis and discussion of five different types of cleaners or wetting agents now in use on various railroads.

After a brief discussion of the water requirements of mechanical washers, the committee concluded its report as follows: "There are so many types of wetting agents and so many factors that affect the properties of a wetting agent that considerable study and trial are necessary to secure the best materials for this purpose. Roads operating through a section of the country where the dust would be largely carbonates would require different treatment from equipment operating through a sandy country where the dust would contain considerable silica. These factors should be taken into consideration before deciding on the wetting agent that would be most effective for car cleaning."

Water for Diesel Locomotives—In a progress report on its assignment to investigate new developments in water conditioning for Diesel locomotive cooling systems and steam generators, the committee stated that its 1947 recommendations for the prevention of corrosion, scale and sludge in Diesel cooling systems are still believed to be valid and the best known practice. It said that a diligent search for a substitute for chromates as a corrosion inhibitor had been unsuccessful. The search was made because chromates are relatively expensive and difficult to secure in adequate quantities. It also stated that it is doubtful if the aluminum portions of Diesel cooling systems can be adequately protected against corrosion under all conditions because of the relatively high electrical potential difference between aluminum and other metals. Locomotive builders, the committee said, are increasingly recognizing this difficulty and are making progress toward the elimination of aluminum from such cooling systems.

After a discussion of the difficulty in maintaining the desired concentration of corrosion inhibitors in cooling waters because of leaks, and the adverse effects of inadequate cooling-water treatment, the committee stated its belief that practices used for water conditioning for Diesel locomotive cooling systems should be extended to other internal combustion engines, such as air-conditioning and train-lighting engines, trucks, busses, shop tractors and automobiles. Operating difficulties experienced by one railroad due to the overheating of newly-installed engine-driven air-conditioning compressors and train-lighting generators were overcome, it said, after the adoption of water conditioning.

The committee described a colorometric analytical procedure that will enable maintenance forces to make a definite evaluation of the amount of chromate present in the cooling system. A quick test of this nature, suitable for use by maintenance forces, is believed, it stated, a requisite in any effort to obtain the desired cooling system conditions.

In a discussion of steam generators for Diesel locomotives, the committee stated that a series of tests conducted on one type of steam generator added considerably to its knowledge concerning the feedwater requirements of such generators. In these tests the following types of feedwater treatment were tried: demineralizing; deaeration; internal treatment with calcined potassium carbonate; corrosion control by pH control; and locomotive chemical feeders.

In conclusion the committee said: "The exact type of treatment selected will have to be governed by the initial type of water available, the volume of water required, the severity of the service requirements, and the existing facilities available. Irrespective of the type of treatment selected, the proportioning equipment used must be accurate and reliable. This indicates the necessity of supplying treated water to the locomotive in a manner similar to that which is employed in the best steam locomotive practice. In addition, the analytical control must be sufficiently frequent and accurate to ascertain definitely that proper treatment is being maintained at all times. It is believed this can not be done by the maintenance forces but must be done by a properly trained water engineer."

Iron and Steel Structures

E. S. Birkenwald, Chairman*

Five of seven assignments were reported on by this committee, including revision of the Manual, two progress reports, and two final reports.

Revision of Manual—Under this assignment the committee presented material to replace existing material in eight sections of that part of the Manual devoted to Specifications for Steel Railway Bridges. In addition, it added one section to these specifications and noted that one other section was in process of development. It also submitted for reapproval, without change, Specifications for Erection of Steel Railway Bridges, Track Anchorage on Bridges and Similar Structures, and submitted for reapproval with an editorial change, Classification of Railway Bridges.

The committee further recommended revisions in those parts of Article 206 of the Specifications for Steel Railway Bridges which refer to impact. In support of these latter revisions it presented a statement, with tables and diagrams, showing the results of impact

**Engineer Bridges, Western Lines, Southern*

ests conducted by the research staff of the Engineering division, A.A.R.

The recommendations of the committee were approved by the convention.

Welding and Gas Cutting—Collaborating with American Society for Testing Materials Committee on Steel and the American Welding Society Conference Committee on Bridges, the committee submitted, as information, a final report on specifications for fusion welding and gas cutting, including recommended revision of the section of the Manual on Fusion Welding.

In its report the committee discussed some of the reasons which have kept the use of welding largely confined to the repair and strengthening of existing railway bridges; and reviewed its work on fusion welding and gas cutting. It also reviewed its connection with the A.W.S. Conference Committee on Bridges which prepared the Standard Specifications for Welded Highway and Railway Bridges — Design, Construction and Repair, published in 1947 by the A.W.S. These specifications, the committee stated, represent the latest information on welded bridge design, and it recommended—as a revision in the Manual—that when welding is permitted these specification be used.

Design of Bridge Details—Occasioned by a controversy as to the application of Article 445 of the Specifications for Steel Railway Bridges in regard to the thickness of the base plate for a bridge rocker assembly, the committee submitted as information a report on bridge rocker shoe assembly tests, by M. B. Lagaard, associate professor of civil engineering, Northwestern Technological Institute. It stated that, since a bridge rocker transmits its load to the base plate through a line bearing, the requirement that the thickness of the base plate be not less than half the difference in width between the top and bottom bearing surfaces necessitates the use of a plate, slab or casting having a thickness not less than half the total width, which is uneconomical. Structurally, considering the slab as a cantilever, no such thickness is necessary. However, the committee stated that the tests did develop that there is need for further research to determine for bridge rocker assemblies a ratio of thickness to width of base slab, which will assure the application of suitable bearing pressure to the masonry.

Shortening of Eyebars—On the basis of material presented in a progress report last year on the shortening of eyebars to equalize the stress, the committee this year presented recommended practice for such shortening of eyebars, with the recommendation that it be adopted and published in the Manual.

Cold-Riveted Construction—On its assignment on specification for cold-riveted construction, the committee presented, as information, a progress report on a program of investigation, formulated by the Research Council on Riveted and Bolted Structural Joints, which, among other things, is expected to develop information relative to cold-driven rivets. The committee stated that this council, sponsored by nine agencies interested in information on riveted construction, have approved seven projects for investigation, and that tests are being conducted at Northwestern University and the University of Illinois.

Committee on Clearances

J. E. South, Chairman*

The committee presented reports on three of its four assignments, including one on revision of the Manual, a progress report submitted for approval, and a progress report presented as information.

Revision of Manual—Under this assignment the committee recommended four minor revisions in the wording of certain material appearing in the Manual.

The recommendations of the committee were approved by the convention.

Clearance Diagrams—On its assignment to provide clearance diagrams for recommended practice, collaborating with other committees concerned, the committee presented a progress report which includes a revision of Fig. 7, Clearance Diagrams for Platforms, submitted for approval, and the submission of Fig. 8 of these diagrams for reapproval.

State Requirements—In a progress report presented as information, the committee submitted a tabulation of the railroad clearance requirements of the various states and Canada.

**Engineer Bridges & Buildings, Pennsylvania*

Wood Preservation

C. S. Burt, Chairman*

The committee submitted, as information, progress reports on 4 of its 11 assignments.

Service Test Records—Under this assignment—Service Test Records of Treated Wood—the committee submitted a progress report on the tests which have been conducted by the Atchinson, Topeka & Santa Fe, and by the Northern Pacific, to determine service life for ties of various woods and treatments. In addition to a general discussion of the test sections on these roads, the report includes tables showing the performance of the ties in each test section up to the time of the latest inspection.

Incising Forest Products—During the past year the committee conducted tests at the Orrville laboratory of the Koppers Company to study the effect of incising, and presented a progress report on its study. The report describes tests on both heart white oak and heart southern yellow pine to determine the effect of incising on penetration of creosote, first with a pressure period of 6 hr., and then by a pressure period of 12 hr., and points out that for white oak incising had very little effect on penetration, but on yellow pine produced a more even line of penetration than occurred in the unincised sample. It states further than there was little evidence that the longer pressure period increased the penetration.

Another series of tests described in the report was made to determine the effectiveness of additional incising on the penetration of creosote in white oak. In these tests the number of incisions was four times as great as the standard A.RE.A. pattern, and the treating periods were again 6 hr. and 12 hr. The report states that although creosote penetration stopped at the depth of the incising marks, the increased number of knife marks resulted in more even penetration.

Specifications for Creosote—The committee submitted a progress report on its assignment to review the specifications for creosote, with particular respect to limitation of residue above 355 deg. C., and other revisions resulting from changes in processes of manufacture, and stated that it is making an intensive survey of service records to determine whether there is anything in these records to warrant any limitation of residue above 355 deg. C. It also stated that, as regards any changes in the specifications called for by changes in manufacturing process, it had found no changes in the manufacturing process, and that with respect to an impression recently current that excessive quantities of tar acids, naphthalene and other constituents are now being removed from the creosote, such practice was not found to exist.

Conditioning of Forest Products—On its study of preliminary conditioning of forest products for treatment by artificial methods of seasoning, the committee presented a progress report as information. The report discusses studies undertaken at Sommerville, Tex., (Atchison, Topeka & Santa Fe) to determine the effectiveness of urea impregnations for retarding checks in red oak and southern pine during seasoning; a bridge tie test on the Pennsylvania, in which test creosoted, green Boulton-seasoned oak bridge ties are being compared with creosote air-seasoned oak bridge ties; and the old procedure, recently revived, of drying wood by boiling it in oil.

The committee found that urea impregnation was significantly effective in retarding checks only in the case of the southern pine timbers. It also found that initial urea processing before creosote treatment does not appear to increase absorption or distribution of the preservative.

After observation of the test bridge ties on the Pennsylvania, the committee found no noticeable difference between the two types of ties.

**Manager, Forest Products Bureau, Illinois Central System*

Roadway and Ballast

W. C. Swartout, Chairman*

This committee submitted reports on 4 of its 10 assignments.

Physical Properties of Earth Materials—Under this assignment as it relates to the load capacity of the roadbed, its relationship to ballast, and allowable pressures, the committee presented a preliminary report on the use of soil pressure cells with electrical recording equipment for the measurement of pressures in railroad subgrades under moving loads. These tests were conducted on the Chicago & North Western during July and August, 1947, under the direction of members of the research staff of the Engineering Division, A.A.R.

The purpose of the tests, the committee said, is to check the theory of soil pressures based on assumptions relating to the elastic properties of soils, and to develop information on vertical and lateral stresses in soils. The work in 1947 was concerned only with the trial of several types of cells and the methods of installation to determine from which the best results may be expected. The committee described briefly the three different types of cells used, and how the cells were calibrated and installed.

In conclusion it stated that the results obtained indicated that all the cells used can be adapted to the measurement of subgrade soil pressures. No analysis of the cells has been made, it said, but the indicated pressure appears proportional to the load on the tie. The data indicate that additional tests, especially for horizontal pressure, may be of value. According to the committee, the tests show that the bearing of the tie affects the indicated pressures greatly and demonstrates that considerable impact effect is present.

Wood Culverts—The committee presented a progress report which included a tentative plan on wood box culverts and requested comments and criticisms thereon. The plan shows several types of wood culverts used by a number of railroads. It said that the types shown can be built from local timber at relatively low cost when a new line is under construction.

In concluding its report the committee stated: "The continued use of timber culverts depends primarily on the availability of such timber, the cost of other materials and the economic life that may be obtained from each type in the locality where it will be used."

Roadway Drainage—As a further check on adherence to recommended practice for roadway drainage, the committee submitted a questionnaire to officers of 25 railroads, 21 of whom replied. A study of the replies, the committee said, revealed little change in practice from that disclosed as the result of inquires made in 1942.

Stablization of Roadbed—Under this assignment the committee presented the third progress report of the investigation of methods of roadbed stabilization. The report this year covers the stabilization of the roadbed by pole and tie driving and sand-filling spud holes, in addition to further consideration of pressure grouting, particularly with respect to th grouting of slides.

The report includes a table which gives the available information on all the grouting projects observed in the course of this investigation. For a number of 1945 and 1946 jobs the data include the maintenance records both before and after grouting. To the extent that the limited period of observation permits conclusions to be drawn, the report states, this showing is very favorable.

The committee stated that a most interesting development in pressure grouting is the adaptation of the process to sliding or slumping fills. Fills as high as 80 ft. have been treated. The committee stated that, while there is no complete agreement as yet, the heavy grouting work required to stabilize a fill will return as much maintenance savings as out-of-face grouting of soft track and ballast pockets. The removal of slow orders and potential hazards to traffic have, for some roads, shifted the balance in favor of unstable-fill grouting, he said.

Following a description in some detail of the conditions encountered on the fills of five railroads, the committee presented a discussion on the injection of grout into fills, covering explanations of the presence of considerable voids in fill, the progressive loss of stability of clay fills, and underground water seeping into fills. The discussion was concluded with the statement that, while the permanence of stabilization by pressure grouting is yet to be proved, indications are that most projects in service will return full value in labor savings alone within three to four years.

The committee described an example of slope stabilization by drainage on the Northern Pacific near Tacoma, Wash. In this case the construction of a drainage tunnel has completely corrected sliding conditions at this location, it said.

In its discussion of stabilization by sand-filled spud holes, the committee presented information from a report on this method by D. W. Brosnan, general manager of the Central lines of the Southern. Basically this method consists of driving a 12-in. by 12-in. timber spud a maximum depth of 8-ft., pulling out the spud and immediately filling the hole with sand. According to the report, the results of the first projects stabilized by this method have been very good and have indicated that the process has merit for use in the lower fills and in soft track areas. While it is too early to predict the lasting qualities of this type of stabilization, the the cost of the work.

The committee's investigation of stabilization by tie and pole driving was limited to installations on the Missouri Pacific and the Atchison Topeka & Santa Fe. Two installations on the first road were described, one made in 1932 and the other in 1945. The savings in line and grade restorations that resulted from the 1932 installations are estimated by the railroad to be three man-hours daily. Although no figures are available on the 1945 installation, maintenance officers on the road agree that it is proportionately greater for the time it has been in service.

In the description of pole driving on the Santa Fe to stabilize roadway, the committee stated that, according to local maintenance officers, this method has been very successful.

Roadbed Across Reservoirs—Under a new assignment on specifications for the construction and maintenance of roadbed across reservoir areas, the committee submitted a report of progress pending more mature study. The committee discussed this subject under the following headings: General; Procedure and Reimbursement; Appropriation of Right-of-Way; Details of Construction; and Track Standards.

Included in the report are drawings which depict typical roadbed sections used by some of the railroads on past construction.

Assistant Engineer, Missouri Pacific

Records and Accounts

F. B. Baldwin, Chairman*

This committee presented reports on six of its seven assignments, including one on Revision of Manual with recommended changes, one final report submitted as information, and four progress reports.

Revision of Manual—Under this assignment the committee recommended for reinstatement in the Manual, certain material which was excluded when the Manual was revised and rearranged in 1943. This material covers data regarding sizes of sheets for engineering drawings, forms and charts; and data containing designations for taper, batter, cant, slope, incline and grade. The committee also recommended for insertion in the Manual as a new page, data concerning mechanical-drawing and graphical symbols. All the recommendations of the committee were approved.

Bibliography—Continuing its practice of previous years, the committee presented a bibliography of subjects pertaining to records and accounts. Covering the period from November, 1946, to November, 1947, the bibliography includes seven books, two pamphlets, and 61 articles which have appeared in various periodicals.

Office and Drafting Practices—This assignment was divided in two parts: (a) organization; duties and nature of as-

Valuation Engineer System, Atchison, Topeka & Santa Fe

signments; and (b) modern mechanical drafting aids. The committee presented, as information, a final report on part (b) only, although it recommended that the subject be reassigned after a number of years when new developments make another report desirable.

In its report on this subject the committee described a number of modern mechanical drafting aids which have been used in various engineering drafting offices, but not necessarily on railroads.

Brief descriptions of the instruments and procedure used for plotting maps from photographs were presented, as were new developments in machines and processes for reproducing drawings, including the reproduction of pencil tracings on tracing cloth, vapor-developed prints, special developers, and improved blueprint paper. Also discussed were drafting-table reconditioning, lettering guides, lettering machines, filing equipment and illumination.

Construction Reports—In the report on this subject consideration was given to the depreciation records as maintained under the regulations of the Interstate Commerce Commission and the Bureau of Internal Revenue. The requirements of these two bodies, said the committee, while similar in nature are so dissimilar in application that a dual set of records must be maintained. The committee called attention to the desirability of segregating items which are non-depreciable on the Bureau of Internal Revenue basis from items which are depreciable on both bases, and stated that, if this segregation is made concurrently with the preparation of the completion report for each A.F.E., it can be done more economically than by having to search for concealed items buried in the details of large projects, and with less likelihood of error.

Field reports on construction projects, the committee stated, should be so prepared that distribution can be made between investment in road and equipment, and operating expenses, and should distinguish between parts of a unit reused and parts retired; and construction contracts should be let in such a manner that units and costs for record purposes may be available. The committee did not attempt to solve the problems cited, either by preparing forms or prescribing methods of reporting. Each carrier, it stated, should adopt such methods of reporting as will fit, easily and adequately, into its methods of handling and accounting.

Valuation and Depreciation—This assignment was broken down into three parts: (a), current developments in connection with regulatory bodies and courts; (b) I.C.C. valuation orders and reports; and (c) development of depreciation data. A progress report presented by the committee this year covered only part (a). This report gives such information as the amount appropriated for the Bureau of Valuation of the I.C.C. for the current fiscal year; the total force of the bureau; the amounts charged by Class I railroads to valuation expenses during 1946; and the returns filed by the railroads. It discusses the activities of the engineering and accounting sections of the Bureau in bringing inventories and valuations of the carriers up to date. It states that no tentative valuations as of current dates were completed and served on railroad companies, but that the bureau had brought up to date underlying valuation estimates of carriers involved in reorganization proceedings and other cases.

In a discussion of the proceedings of Ex Parte No. 166, Increased Freight Rates 1947, the report quotes an excerpt from that portion of the I.C.C.'s decision and report of October 6 contained under the heading Valuation of Railroad Properties. This excerpt includes the Bureau of Valuation's elements of value for Class I line-haul railways, estimated as of January 1, 1947. The discussion on this subject includes the comments on the I.C.C.'s findings of "value", which were presented by the carriers when they testified at the Chicago hearing to show that the commission's estimate was too low.

The report also includes a brief discussion of two court decisions. One of these was the decision, on June 25, 1947, by the Supreme Court of Ohio, on a rate-order case, and the other was the decision, on May 22, 1947, by the New York State Court of Appeals, also on a rate-order case.

I.C.C. Accounting Classifications—In a progress report presented as information on its assignment on changes in, revisions, and interpretations of I.C.C. accounting classifications, the committee listed four orders of the I.C.C. of interest to engineers, which have been issued since the committee's last report on this subject in 1946. The committee mentioned the I.C.C. decision, in Docket No. 29140, February 10, 1947, in which the commission found that expenditures for labor and material in driving posts and for pressure grouting to arrest water pockets and mud heaves, were properly chargeable to operating expenses.

In addition it listed three other rulings by the Bureau of Accounts, and mentioned briefly the requirements of a new accounting series circular issued by the bureau.

Committee on Wood Bridges

S. F. Grear, Chairman*

Of its seven assignments, this committee submitted a report on only that assignment dealing with the design of creosoted timber pile piers for long spans.

Pile Piers for Long Spans—In a final report on this assignment the committee presented two plans to illustrate recommended practice in the design and framing of a pier for an assumed truss span 150 ft. long, having either a girder span approach or a pile trestle approach. Previously presented as information and for critical review in 1946, these plans were presented this year for adoption and publication in the Manual. The committee stated that, although the essential features of design and arrangement of such piers appear to be quite uniform among the railroads, variations prevail in the details of framing. Accordingly, suitable notes were made a part of the plans to allow for rather wide variations from the construction shown to meet local conditions or individual practice. This report was received without discussion.

*Assistant Engineer Bridges, Illinois Central

Report on Work Equipment

Edgar Bennett, Chairman*

Final reports were submitted by this committee on snow removal equipment, power spike machines, flame-cleaning equipment, equipment for stabilizing roadbed, and ballast-cleaning equipment. Also, progress reports were presented on revision of the Manual, power ballasting machines, power cribbing machines, and standardization of parts and accessories for motor cars.

Revision of Manual—The committee recommended that the subject matter in the Manual under the title "Methods of Maintaining Motor Cars" be removed, and the substitution therefore of new material to appear under the title "Care and Operation of Maintenance-of-Way Work Equipment". This recommendation was made, the committee stated, because the subject matter appearing under the former title is out of date. The maintenance of motor cars has now been submerged in the maintenance of work equipment generally, and the care and operation of such equipment has a direct bearing on the maintenance of motor cars. The recommendation of the committee was approved.

Standardization of Motor Car Parts—In a report on its assignment to investigate standardization of parts and accessories for railway motor cars, the committee discussed limit of wear on pressed steel wheels, and offered recommendations as to the inspection and replacement of such wheels. It also considered the use of windshields, cab tops and electric lights on motor cars, and stated that, in its opinion, it is not necessary to equip every motor car with such accessories, regardless of the type of service to which it is assigned. "The many varying and changeable conditions and requirements of service must govern the need

*Chief Engineer Maintenance of Way & Structures, Central Lines, Southern.

for and application of such accessories."

Power Ballasting Machines—In 1944 the committee described an on-track power ballasting machine, which it found particularly deficient in that it did not tamp on both sides of the same tie simultaneously." In this year's report the committee described a new type of on-track machine, developed to overcome this objection, which was put in service on the New York Central in 1946, and which during that season tamped more than 70 mi. of high-speed track at a reported lower cost than would have been incurred by other means.

The committee also noted that the manufacturer of electric vibratory tampers has brought out a multiple-tamper ballasting machine, but stated that it had not gathered sufficient information to discuss it in detail.

Snow Removal Equipment—A final report by this committee, supplementing last year's progress report, includes a detailed discussion of the use of five general types of snow-handling machines. The on-track machines covered includes rotary snowplows, railroad flangers, and cranes, while the off-track units include crawler-type cranes and a small, tractor-mounted, rotary-type snowplow. Also discussed were various types of air compressors, available as either off-track or on-track machines, for blowng snow. In addition to descriptions of the machines, the discussion also covers the general application of each type.

Power Cribbing Machines—In a progress report on this subject the committee described three types of on-track machines developed for cleaning cribs. The first machine described excavates the ballast from the tie cribs and deposits it beyond the ends of the ties by means of a pivoted digger boom equipped with an endless roller chain. The second type is a self-propelled machine, now being built, which pushes the ballast from the ends of the ties to a position between the rails by means of hydraulically-operated rams, the ballast then being picked up by a bucket digging conveyor and delivered to a vibrating screen for separating the ballast from the dirt. The third machine described, another self-propelled type, employs eight transversely-acting digger bars mounted on a heavy crosshead extending across the track the full length of the crib. The digger bars, four of which work outward each way from the center of the track, deposit the ballast beyond the ends of the ties.

Power Spike Machines—With the recommendation that this subject be discontinued, the committee presented, as information, a final report which includes a detailed discussion of the pneumatic spike driver and two self-contained gasoline-powered spike drivers.

Flame-Cleaning Equipment—In a final report on this assignment the committee stated that the oxyacetylene flame has been found to be best adapted and most generally used for the flame cleaning of steel. The report discusses the types of descaling tips which may be applied to welding torches or extension blow pipes for this purpose, and lists equipment required for a two-torch operation.

For removing heavy coats of old paint from buildings of frame or other type construction, the committee discussed the use of butane or propane gas with large hand torches similar to those used in melting snow or burning weeds.

Roadbed Stabilizing Equipment—On its assignment to investigate machinery and equipment for stabilizing roadbed, the committee presented a final report which discusses and illustrates two methods of roadbed stabilization not covered in its report last year. These methods include the driving of piles at the ends of the ties—a method that has been used by some railroads for 30 years with success—and the driving of spuds into unstable roadbed and withdrawing them to back-fill with sand.

Ballast-Cleaning Equipment—On this subject, last reported on in 1932, the committee presented a final report as information. Following a general discussion of this subject, the report describes and illustrates a railroad-designed, on-track, shoulder ballast-cleaning machines, three of which have been in use on an eastern railroad for several years, and also a more recently developed shoulder ballast cleaner of unusually large capacity, which is now in successful operation on a western railroad.

In conclusion, the committee stated that a first-class job of shoulder ballast cleaning is being secured by both types of machines, and that the results to date indicate that such cleaning has resulted in lowered track maintenance on all tracks cleaned.

Closing this report, the chairman paid tribute to those members of the committee who had recently retired from active railroad work and made a plea to the chief engineering officers of the various roads for their cooperation in getting young men on this committee who can take an active part in its work.

Report on Highways

W. J. Hedley, Chairman*

This committee submitted reports on two of its five assignments, including Revision of Manual. In connection with its second assignment—design and specifications for highway crossings at grade over railroad tracks, both steam and electric, collaborating with the Committee on Track, and with the American Society of Municipal Engineers and the American Transit Association—the committee stated that during the year it has been engaged in the revision of certain specifications.

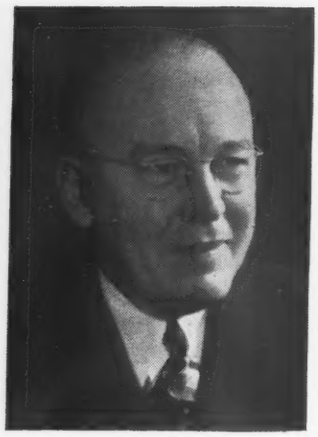
Revision of Manual—Under this assignment the committee completed a general review of all of the Manual material in Chapter 9, and recommended nine specific changes. These changes include complete revision of the older specifications on the construction of grade crossings; changes and deletions in other portions of the text; and minor revisions in a number of crossing protection signal plans to conform to changes recently approved by the Signal section, A.A.R. The entire report was received without comment.

**Assistant Chief Engineer, Wabash*



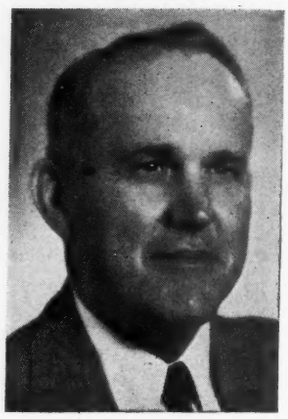
The Seaboard Air Line's signal control machine recently installed at Savannah, Ga.

N.R.A.A. EXHIBIT DRAWS LARGE ATTENDANCE



M. K. Ruppert
President-Elect

Display at International Amphitheatre of latest developments in equipment and materials included products of 100 companies



R. B. Fisher
Secretary

An outstanding event of "Railway Engineering Week" at Chicago was the annual exhibit of the National Railway Appliances Association, held at International Amphitheatre in that city, in which the member companies presented an extensive display of new and improved materials, devices and equipment used in the construction and maintenance of railway tracks, bridges, buildings and water-service facilities. The exhibit opened at 9 a.m. on Monday, March 15, a day ahead of the annual convention of the American Railway Engineering Association, and continued through Thursday, March 18. Large crowds were attracted each day. Free bus service between the Palmer House (scene of the A.R.E.A. meeting) and the exhibit hall was provided by the manufacturers' association.

With the products of 100 companies on display, the exhibit was equal in size, measured by the number of companies participating, to that of last year, and larger than any held during the 20 years prior to 1947.

This year's exhibit was the second full-scale display of the N.R.A.A. to be held since 1941, the first being in 1947. Because of the many unforeseen difficulties which beset the railway supply industry during the period immediately following the end of the war, many manufacturers were not able to get into "full swing" in the production and development of new products until recently. Consequently, the participating companies this year were able to show many new and improved types of materials, appliances, power tools and other equipment that had never been displayed before.

The opportunity of viewing the N.R.A.A. exhibit and talking to the manufacturers' representatives has always been considered one of the highlights of the A.R.E.A. convention week. The comprehensive education thus afforded is considered of inestimable value to railway men. Spiraling labor costs, and the economies which can be effected through the intelligent use of labor-saving devices, were contributing factors helping to stimulate increased interest in the exhibit this year.

The officers who had the responsibility of arranging and supervising the exhibit of the N.R.A.A. this year were: C. L. Mellor (Barco Manufacturing Company), Chicago, president; W. F. Kasper (Fairmont Railway Motors) vice-president; R. B. Fisher (Buda Company), secretary, director of exhibits and chairman of the Exhibit committee; M. K. Ruppert (the P. & M. Co.), treasurer; directors—H. M. McFarlane (O. F. Jordan Company), East Chicago, Ind.; F. P. Cullen (Cullen-Friestedt Company), Chicago; E. D. Cowlin (Eaton Manufacturing Company—Reliance Division), Massillon, Ohio; W. H. Tudor (International Harvester Company—Industrial Power Division), Chicago; R. A. Carr (Dearborn Chemical Company), Chicago; and Jess Mossgrove (Austin-Western Company), Aurora, Ill. W. J. Hanna (Republic Steel Corporation), Chicago, past-president, was director pro-tem for the past year.

New Officers Elected

The association held its annual business meeting at the International Amphitheatre on Tuesday morning, March 16. In the election of officers, Mr. Ruppert was elected president, Mr. McFarlane was elected vice-president, and Mr. Mossgrove was elected treasurer. Mr. Fisher was re-elected secretary.

J. B. Templeton (Templeton, Kenly & Co.), Chicago, and E. W. Backes (Carnegie-Illinois Steel Corporation), Chicago, were elected directors to serve for terms of two years. Messrs. Cowlin, Tudor and Carr will continue as directors. Mr. Mellor will remain as director pro-tem for one year.

List of Exhibitors

The companies participating in the exhibits, with the products on display and the names of representatives, were as follows:

A

Achuff Railway Supply Company, St. Louis, Mo.; rail anchors, spring washers, tie-saver track pad, rail & curve lubricator; G. W. Achuff, H. G. Rowe, A. Milton Wells.

Air Reduction Sales Company, New York; rail-cropping machine, carbide lamps, flame-cleaning and dehydrating apparatus, display of acetylene, oxygen, helium, argon, nitrogen, carbonic-gas and hydrogen cylinders; W. C. Bettes, L. D. Brennon, N. C. Brink, Charles A. Daley, W. S. Hopkins, Jr., W. P. Kellog, J. W. Kenefic, L. C. McDowell, U. F. Portell, W. P. Rogers, D. J. Williams.

Allied Chemical & Dye Corp., General Chemical Division, New York; reproductions of noxious weeds, photographs of spray trains, literature on Formula #7 weed killer; R. N. Chipman, A. M. Dean, A. O. Feigin.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis.; Diesel crawler tractor equipped with front-end shovel and two-wheel scraper, bulldozer blade, wheel tractor with side mower; Paul Blakely, Earl Blunk, G. Byrnes, A. C. Dealer, V. M. Dobens, J. Dobeus, Wm. Faulkner, J. Hailer, V. Halloway, J. Hawkins, Chas. Karr, H. T. Larmore, H. Masuhr, H. Nelson, M. L. Noel, R. Pilling, W. R. Richmond, Otto Rollman, W. M. Schroeder, Fred Schwinn.

American Fork & Hoe Co., Cleveland, Ohio; rail anchors, tapered joint shims, safety rail forks; C. C. Connolly, J. J. Nolan, D. L. O'Brien, F. J. Reagan, Robert Simpson, John Skeel, R. J. Whalen.

American Hoist & Derrick Co., St. Paul, Minn.; model of Diesel-electric locomotive crane, blocks and sheaves, hand winches, clips; J. B. Akers, Steve C. Brown, George Cooper, Lee E. Coulter, George M. Dallas, J. W. Hartley, John Hogan, S. M. Hunter, E. S. McCormick, Ralph W. Payne, Stanley H. Smith, W. C. Wilson.

Armco Drainage & Metal Products, Inc., Middletown, Ohio; metal buildings, pipe and coupling, perforated pipe, multiplate, quick coupling pipe, sheeting, plate-lined underpass; C. H. Anderson, G. R. Betts, F. Bolton, H. S. Claybaugh, E. T. Cross, V. W. Davis, J. D. Faylor, C. Fisher, N. A. Powell, W. O. Robertson, K. A. Smith, W. H. Spindler, R. N. Tracy, Felix Truss.

Austin-Western Company, Aurora Ill.; models of railroad dump cars; Jess Mossgrove, Geo. Sines.

B

Barber-Greene Company, Aurora, Ill.; railroad snow loader and melter, railroad coaling station, ditchers-bucket loaders, belt conveyors, portable ash, coal and aggregate handling equipment, portable asphalt plants, sand dryers, pneumatic-tired and crawler type snow loaders; H. A. Barber, W. H. Brett, John Elwood, Joseph Green, W. B. Greene, H. R. Haase, M. C. Ham, W. B. Holder, Donald Lamoreaux, B. E. Lindstrom, F. J. Merrill, H. W. Newton, R. W. Richardson, Paul Rohr, E. D. Stearns, J. D. Turner.

Barco Manufacturing Company, Chicago; unit tie tampers, hammers, drills, flexible ball pipe joints, spike driver with carriage; F. N. Bard, W. J. Behlke, C. C. Cox, B. H. Ferguson, C. O. Jenista, W. T. Jones, L. J. Lytle, J. L. McLean, C. L. Mellor, W. B. Miller, J. L. Olle.

Bernuth, Lemocke Company, New York; elastic rail spikes, tie-plate anchor spike, literature; W. A. Fisher, A. C. Jack, B. Kuckuck.

Buda Company, Harvey, Ill.; crossing gate, tractors, power, earth, track and bonding drills, aluminum-alloy track jack, other track jacks, bridge jack, hydraulic jacks, ball-bearing journal jack, rail bender, track liner, Diesel nozzle tester, fork truck, platform truck, Diesel generator set and Diesel power unit; J. W. Biety, E. Broholm, H. H. Cohenour, R. B. Fisher, W. A. Hart, Jack Hiltibrand, L. O. Kerlin, C. Stuart Kerr, Tom LaVorene, C. A. Leetz, R. K. Mangan, R. J. Mulroney, J. M. Padgett, Ken Preisel, J. R. Reichert, H. E. Roth, M. J. Rotroff, J. W. Sanford, C. W. Smith, Karl Waller, R. P. Williamson, H. A. Wolfe.

C

Caterpillar Tractor Company, Peoria, Ill.; crawler tractors, cable-controlled bulldozer, cable control, crane attachment, winch, and various parts, Glen Crawford, R. D. Evans, Don Graham, W. A. Grau, Dale Gronsdahl, Charles Holmes, Theron Howard, William Hunt, Bob Hutchinson, C. E. Jones, Roman Pitzen, F. E. Schaumburg, Thomas Taylor, J. J. Valentine, Frank Vigneault, Jr.

Chicago Pneumatic Tool Company, New York; air compressors, gas tampers, pneumatic tampers, spike drivers, drills, wood borers, impact wrenches and grinders, electric tools; H. G. Barbee, J. J. Brown, C. L. Butler, S. A. Congdon, H. R. Devbel, J. E. Hopping, W. C. Jennings, C. D. Nicholls, Wm. Pallowick, E. S. Rosselle, F. M. Williams.

Chipman Chemical Company, Bound Brook, N. J.; de-icing paste and liquids, weed-killing service, literature; R. B. Coleman, Lin Harris, C. S. Langdon, N. J. Leavitt, W. H. Moyer, A. J. Reading, J. D. Ruttan, J. T. Sandberg.

Crerar, Adams & Co., Chicago; pipe tools, railroad crayons, taps and reamers, track tools, track and bonding drills, electric lanterns, electric impact tool, hydraulic equipment, burning torches; M. A. Arenz, Reinhard Besant, Cliff Borneman, T. J. Connelly, George J. Doyle, Charles Grentz, O. C. Liesendahl, H. C. White.

Cullen-Friestedt Company, Chicago; motion pictures of rail-lying cranes in action; W. C. Bamber, K. J. Beller, L. B. Bertaux, C. J. Bronez, E. V. Cullen, F. J. Cullen, F. P. Cullen, C. G. Edwards, T. G. Frazee, J. K. Huybers, R. W. Jamison, F. L. Kendig, J. Kudrna, J. F. Leonard, D. L. O'Brien, G. G. Prest, W. J. Roehl, George Rumble, J. E. Simkins.

D

Dearborn Chemical Company, Chicago; rust preventives for structures, rust preventives and lubricant for rail joints, wrappers for pipe-line protection, feed-water treatment and test equipment, chemical proportioning equipment and pumps, blow-off and desludging equipment, de-ionizing equipment; D. B. Bishop, L. D. Brown, R. A. Carr, F. I. Chapman, E. M. Converse, E. R. Glover, E. A. Goodnow, L. O. Gunderson, A. L. Johnson, S. C. Johnson, H. E. Johnston, F. A. Jones, L. H. Kehm, F. L. Konigsmark, H. J. Michal, R. H. Miller, R. Q. Milnes, R. L. Oliver, E. F. Peters, D. D. Powers, C. C. Rausch, J. P. Rodger, E. M. Welch, J. E. Wilkes.

Henry Disston & Sons, Inc., Philadelphia, Pa.; gasoline-powered chain saw, pneumatic-powered chain saw, chain-saw precision grinder; W. W. Bender, B. F. Durand, E. J. Gebhart, C. Irvin, L. W. Ketcher, G. C. Moelhman.

Duff-Norton Manufacturing Company, Pittsburgh, Pa.; track jack, bridge jack, car jack, locomotive jacks; aluminum track jack; D. Christopher, D. F. Evans, W. I. Floyd, J. Gilchrist, Jr., T. W. Krueger, L. E. Lee, G. L. Mayer, W. W. Moody, F. Schwerin, N. A. Sinclair.

Duncan Wire Stretcher Company, Chicago; wire stretcher; Abner D. Duncan.

E

Eaton Manufacturing Company, Reliance Division, Massilon, Ohio; various types of spring washers; E. D. Cowlin, S. E. Cowlin, C. A. Esinhart, R. F. Golden, E. C. Gross, Sr., E. C. Gross, Jr., E. J. Helline, F. K. Howell, R. B. Little, H. J. McGinn, A. H. Weston.

Electric Tamper & Equipment Co., Ludington, Mich.; gas and electric-driven flexible-shaft concrete vibrators, hydraulic concrete vibrator, electric vibratory screed, vibratory tie tampers, gas-electric generator sets, junction box; mutiple tampers, soil compacter; H. W. Cutshall, A. W. Davis,

Charles Derler, Morgan D. Hall, Glen H. Haywood, James F. Hensel, Raymond F. Hermann, A. B. Holt, C. Jackson, Charles R. Leedham, James T. Lydon, Warren J. Meyers, George J. Morris, Lowell S. Osborn, Hugh D. Piper, James M. Webb, Morton S. Westlund.

Encyclopedia Britannica, Chicago; research service, copies of publication; Armin Eastman, H. J. Jaro, P. H. Jarrett, M. Lowenson, Ken Osbon, J. B. Walsh.

Eutectic Welding Alloys Corporation, New York; demonstration of low-temperature welding rod and flux, literature; Robert Groman, Jack Koske, Anthony Larweth, Paul Miller, Leon Richardson, Frank Romano, William Svance, Albert Zeisel.

F

Fabreeka Products Company, Boston, Mass.; literature and samples, tie pad; Allen E. Bardwell, Wm. P. Brennan, F. A. Hofmann, R. R. Howard, S. S. Maurer, Wm. B. Rogers, F. B. Summers.

Fairbanks, Morse & Co., Chicago; motor cars, pumps, wheels, light plants, scales, battery chargers, electric motors, portable lights; W. F. Anderson, P. J. Anthony, C. W. Bockelman, N. W. Charlesworth, E. P. Chase, L. L. Farris, J. R. Frost, A. H. Gade, D. D. George, E. C. Golladay, W. W. Guernsey, C. O. Gwinn, C. J. Helmholtz, H. L. Hilleary, D. Hopkins, A. G. Hosford, C. S. Konzelmann, R. F. Lane, D. K. Lee, J. F. Marquitz, L. H. Mathews, T. E. McLaffan, II, C. B. O'Neil, R. W. Perry, J. S. Peterson, J. J. Poirier, C. A. Rauch, C. H. Reed, H. J. Renken, A. M. Roberts, B. H. Roberts, N. A. Sproesser, R. L. Thomas, C. H. Turner, C. VanNatta, A. Walker, W. C. Zellmer.

Fairmont Railway Motors, Inc., Fairmont, Minn.; inspection, section and gang motor cars, weed mower, grouting outfit, derrick car, oil spray car, motor car accessories, compressor trailer and electric starter; G. F. Adams, O. F. Banke, W. A. Banke, C. P. Benning, C. W. Brhel, W. D. Brooks, O. F. Buscho, K. K. Cavins, C. J. Dammann, D. E. Doolittle, I. N. Eustis, R. B. Evans, Tracy Horn, C. H. Johnson, F. W. Kasper, W. F. Kasper, F. A. Kaup, R. H. McCune N. J. McDonald, G. E. Neffeler, C. L. Rager, W. H. Ripken, F. G. Simmons, H. A. Sly, R. W. Stenzel, Ira Sublett, R. G. Wade, W. M. Williamson.

G

Griswold Signal Company, Minneapolis, Minn.; automatic crossing gate with flashing lights, cross bucks, track sign, "stop-on-red" signal sign, rotating banner with flashing lights, relay cases, meter box, cable post and foundation, gate and motor controls, gate mechanism and swinging gate lamps; F. Anderson, F. W. Griswold, A. M. Lee D. R. Murray, O. Scott Tompkins, F. Trumble, G. E. Woodis.

H

Harnischfeger Corporation, Milwaukee, Wis.; arc welders, arc-welding electrodes, crane control, electric hoists; G. C. Artus, B. Ballman, L. C. Danielson, B. Germershausen, M. Johnson, P. C. Petry, A. Rutkowski, G. Schmus, E. T. Slackford, O. C. Spratt.

Hayes Track Appliance Company, Richmond, Ind.; wheel stop; R. A. Downing, Brice E. Hayes, S. W. Hayes, G. O. Markey, Herbert J. Mayer, Paul C. McClure, M. Moore, R. C. Stiver.

Hobart Bros. Company, Troy, Ohio; self propelled welder, railway battery charging units, arc-welding machines; Robert C. Bercaw, Harry K. Miller, A. T. Mortrud, John Sampson, Richard L. Sherwood, Glyn Williams.

Hubbard & Co. Pittsburgh, Pa.; rail anchors, spring washers, track tools; spike mauls, track chisels, sledge hammers; B. F. Frazier, A. L. Fridley, J. H. Hines, N. A. Howell, A. C. Laessig, J. Louis Wenzel.

I

Industrial Brownhoist Corporation, Bay City, Mich.; model of Diesel crane display showing application of locomotive, Diesel, Diesel-electric, steam and gas cranes, pile drivers, car dumpers, ballast-cleaning machine, coal and ore unloaders storage bridges, clamshell buckets; A. P. Lyvers, Marshall A. Norby, Max Riebeneck III.

Ingersoll-Rand Company, New York; crawler-mounted compressor, spot-tamper compressor, two-tool spot tamper, tie tampers, spike drivers, pneumatic tools; R. C. Baldwin, George Brahler, J. Crocker, N. Ham, C. Hansen, E. L. Hawes, H. L. Kent, L. Luther, T. Weigand.

Insley Manufacturing Corporation, Indianapolis, Ind.; crane; James Elliott, W. B. Elliott, William Elliott, Charles Klee, A. L. Perkins, Fred B. Ray.

International Harvester Company—Industrial Power Division, Chicago; tractor and mower, crawler tractor with front-end loader; crawler tractor with angle dozer; H. B. Cadm s, H. M. Carlson, Art Dubois, R. E. Joerger, W. H. Kuhlman, R. C. Larkin, G. H. Morse, Dick O'Mar, J. R. Roberts, Lyman Tichnor, W. H. Tudor, John Vogler, L. W. Warfel.

J

Johns-Manville Sales Corporation, New York; asphalt tile, wall board, lagging, roofing and siding, packings, asbestos-cement smoke jacks and pipe; C. E. Bryant, Jr., G. J. Campbell, Fred Fix, S. H. Flannagan, J. D. Johnson, H. J. Landis, W. G. Morehead, R. J. Offutt, Thomas O'Leary, Jr., C. M. Patten, A. C. Pickett, W. W. Prosser, P. E. Redding, H. B. Reynolds, G. R. Tierney, R. P. Townsend, John H. Trent, F. C. Vandervort.

O. F. Jordan Company, East Chicago, Ind.; speaker, ditcher, snow plow; J. P. Bowers, J. J. Dudzinski, L. J. Emmerling, J. C. Forbes, W. B. Joyce, H. M. McFarlane, Walter J. Riley, William J. Riley, C. W. Shipley, Henry Schneider.

Joyce-Cridland Company, Dayton, Ohio; track jacks, journal jacks, air-motor jacks, automatic lowering jacks, hydraulic jacks, locomotive screw jacks, hydraulics bus and truck lifts; Walter S. Bowers, Huston Brown, Paul Boyd, Dave Stockman, C. N. Thulin.

K

Kalamazoo Manufacturing Company, Kalamazoo, Mich.; section car with top, inspection car, heavy-duty motor car, gages and levels, steel demountable wheels, speed truck, combination gage level, two-cylinder engine with selective transmission; Laurance Boswell, Waldo Bugbee, T. C. Coleman, Jr., Stan Haigh, George W. Hoover, R. E. Keller, G. E. Kistler, George E. Monroe, Howard Mull, Lloyd O. Stratton, Henry E. Fogel, O. W. Youngquist.

Kershaw Company, Montgomery, Ala.; two-ton utility rail derrick, cribbing machine, spike-setting carriage, off-track ballast stripper (wheel type); R. E. Bell, J. P. Crow, J. W. Davis, Adrian del Paso, Jr., Otis B. Duncan, W. D. Hoffman, William B. Joyce, Knox Kershaw, Royce Kershaw, Joseph F. Leonard.

Koehring Company, Milwaukee, Wis.; pictures of shovels, cranes, draglines and mud-jacks, crane with propulsion car, concrete mixer; E. J. Goes, J. V. Miller, J. W. Poulter, J. F. Robbins, J. R. Steelman.

Koppers Company, Pittsburgh, Pa.; roofing, paving, resurfacing materials, bituminous coatings, examples of pressure-treated timber for railroad application; W. P. Arnold, R. H. Bescher, W. O. Boyd, H. C. Busch, H. R. Condon,

M. F. Cravey, H. F. Egan, D. D. Hamilton, M. A. Hamrick, Walter Jacobson, D. C. Jones, W. A. Jones, S. J. Katz, C. E. Masini, E. J. McGehee, W. F. Munnikhuysen, A. R. Nickel, G. C. Rosenquist, M. J. Stiener, G. A. Wagner, J. F. Walsh.

L

Lehon Company, Chicago; asphalt roll roofing and shingles, cold-process roofing, hot built-up asphalt roofs, waterproof felts, fabrics and papers, asphalt roof coatings, aluminum paint; T. L. Connolly, C. E. Croisant, J. E. Eipper, Tom Lehon, E. A. Leonard, A. C. Senseney, J. W. Shoop.

LeRoi Company, Milwaukee, Wis.; tractor-mounted compressor and trailer compressor in combination, oil-bath mower head, engine, rock drills and breakers; 105 ft. compressor with front-end loader, tractor mowing machine, air tools; R. E. Bell, R. H. Bell, Joseph H. Callahan, F. W. Cross, George M. Dallas, R. M. Darr, J. G. Dean, J. M. Dolan, James T. Flynn, K. E. Gifford, S. Gunning, L. E. Heuser, Donald J. Hogan, George M. Hogan, John E. Hogan, Glen C. Hunt, Leon E. Hunt, G. H. Lubeley, H. J. McGaffigan, C. L. Meigs, R. R. Morgan, Winston McPhail, John M. Norton, Daniel L. O'Brien, J. J. O'Brien, N. W. Reinker, R. E. Schatmeyer, N. M. Sedgwick, Stanley H. Smith, S. J. Steven, Lloyd O. Stratton.

Littleford Bros. Inc., Cincinnati, Ohio; portable crossing and platform roller; Robert S. Arthur, D. C. Carter, L. G. Glaser.

Locomotive Finished Materials Company, Atchison, Kan.; cast-steel alloy, self-guarded frog; Norman E. Gillispie, R. L. McIntosh, A. H. Moorhead, H. E. Muchnic, W. H. Muchnic, F. B. Nugent, G. W. Taylor.

M

Maintenance Equipment Company, Chicago; rail layer, lubricator, switch-point protector, derail; E. Overmier, T. E. Rodman, H. V. West, Jr., P. J. Wolf.

Mall Tool Company, Chicago; portable power tools, circular gas powered saws, drills, vibrators, rail grinders; electric and pneumatic Chain Saws; J. C. Banis, E. W. Bettis, R. F. Burgwald, George Comstock, H. B. Constant, A. Deerwester, A. Dolak, C. Gardner, Paul Guss, Chas. Hayes, H. M. Holtgrieve, Morris Johnson, F. Jorgensen, G. Langford, E. Larson, Ray Lind, Art Long, A. W. Mall, F. McGonigle, Carl Nelson, C. Nickerson, R. W. Procter, M. Rehnquist, J. G. Rinehart, W. H. Sanders, R. J. Schwass, Robert Sholeen, Hol Slutz, D. E. Soderberg, K. A. Taylor, J. N. Thorp, P. Walzak.

Marvel Equipment Company, Chicago; switch heaters, switch-heating equipment, power plants, track liner, saw rig, mower, concrete vibrator; Thos. C. Coleman, Jr., Walter Hallerud, Blake C. Howard, Jr., H. F. Jorgensen, O. E. Quinton, J. Royer, John N. Thorp, Jr.

Master Builders Company, Cleveland, Ohio; cement dispersing agents, plastisizing agents for concrete and mortar, membrane curing compound, non-shrink mortars, metallic hardened concrete floor finishes; Erie rust-joint iron machine; V. S. Andrews, C. H. Borcherding, Jess Fellabaum, Frank Hinds, W. M. Jaros, C. A. Lyon, Paul Saint-Amour, B. R. Wood.

Mid-West Forging & Manufacturing Co., Chicago; rail anchors; Noble Gibson, J. L. Hench, Ray T. Johnson, S. M. Lounsberry, Jr., Russell Robertson, James R. Steele, J. R. Wilson.

Modern Railroads Publishing Company, Chicago; copies of publications; John P. Conde, Roy Gurley, Paul F. Jackson, Frank Richter, Jack Rockwell, D. R. Watson.

Ramapo Ajax Division, American Brake Shoe Co., Chicago; switch stands, rail lubricators, tie plates, integral-base crossing, gage rod, switch and stock rails, and fittings, switch stand with switch-point lock; R. A. Burt, G. A. Carlson, R. L.Carmichael, C. P. Corrigan, E. E. Dailey, R. M. Evans, C. E. Godfrey, H. Hazelton, Jr., A. F. Hess, D. F. Hilton, J. V. Houston, A. F. Huber, J. S. Hutchins, J. P. Klienkort, O. F. Mangus, W. A. Maxwell, R. L. McAbee, James McComb, W. C. Muller, E. F. Needham, H. W. Renick.

Magnus Chemical Company, Garwood, N. J.; cleaning equipment, chemical cleaners, emulsions, solvents, akaline solutions, detergents; decarbonizing agents, cleaning-process features for railroad equipment; David Blanchard, J. L. Kelly, Ray Kirkeide, William Mays, T. O'Brien, George Schell, Marcel Zinty.

Modern Frog & Crossing Works, Chicago; manganese crossing corner, rolled-steel milled frog fillers, slide plates, adjustable brace, taper rail, compromise joints; W. Homer Hartz, W. H. Hartz, Jr., George F. Killmer, Lyle I. Martin, Russell W. Martin.

Morrison Railway Supply Corporation, Buffalo, N. Y.; gage holders, switch-point guard, track stabilizer, pile shoes; J. J. Desmond, G. J. Diver, G. W. Diver, John H. Dooling, E. L. Klopfer, M. B. Morrison, R. L. Morrison, E. W. Smith, D. R. Vogel.

Murdock Manufacturing & Supply Co., Cincinnati, Ohio; water service devices; drinking fountain, air valves, check valves, Diesel watering hydrant, sanitary coach water hydrant, car wash boxes; Eugene Leroy, J. Kelso Murdock, H. F. Oswald.

N

National Aluminate Corporation, Chicago; meter-controlled electrically-operated proportioner and chemical pump, vat and mixer, automatic continuous-blow equipment, panel board for control and operating circuits, specimens from research on embrittlement, display of impurities contained in locomotive water, slide film on Nalco service, display showing various phases of water treatment, water-lab for water test equipment, flow switch for controlling proportioner, literature on water treatment and service; C. M. Bardwell, R. A. Bardwell, R. G. Bielenberg, C. A. Brown, J. L. Callahan, E. H. Crosby, P. W. Evans, R. E. Falkinburg, C. B. Flint, J. L. Gibboney, L. S. Heasom, R. V. Lucas, L. L. Lux, H. A. Marshall, V. E. McCoy, A. F. McNeil, E. M. Miller, H. D. Shaw, J. J. Wagler, R. V. Zahm.

National Lock Washer Company, Newark, N. J.; lock washers; T. C. Coleman, Jr., D. W. Hallberg, Eugene Harbeck, Howard Stone, Gilbert E. Webster.

Nichols Engineering Company, Chicago; transfer tables, turntable tractors, roller-bearing turntable trucks, motor drives; Bennett Goldman, Samuel F. Nichols, Samuel H. Nichols, George M. Shearer.

Nordberg Manufacturing Company, Milwaukee, Wis.; tie adzer, rail drill, grinders, power jack, spike puller, spike hammer, track wrench, track gager, cribex and set-off device, bit grinder, tension meter; J. B. Akers, Jr., Dave Anderson, A. W. Banton, W. B. Blix, L. P. Brassy, Z. Chitren, George M. Cooper, George M. Dallas, H. E. Erickson, J. R. Graham, Stan H. Haigh, James F. Hartley, John E. Hogan, John L. Holman, W. S. Isaacs, C. K. Jensch, Eugene Larson, Ralph W. Payne, H. W. Protzeller, Will H. Reaves, John W. Samson, Stanley H. Smith, Lloyd O. Stratton, H. H. Talboys, J. D. Whitaker, W. C. Wilson.

O

Oxweld Railroad Service Company, Chicago; continuous slides featuring history of rail from 1600-1948; rail-end hardening machine; baffle for manual rail-end hardening;

pictorial display of pressure-welded rail locations; L. Adams, G. P. Bogart, R. J. Boyle, M. Burnett, Jr., W. E. Campbell, F. J. Duffie, F. M. Finsthwait, F. J. Graham, E. B. Hall, F. C. Hasse, W. A. Hogan, P. Hunter, Jr., M. E. Keith, R. S. Kerns, J. W. Lacey, P. T. McKinney, H. R. Miller, R. J. Nenneman, D. H. Pittman, J. H. Rodger, K. I. Thompson, R. W. Torbert, S. Toth, J. E. Winslow.

P

P. & M. Co., Chicago; rail anchor; W. J. Garrity, G. E. Johnson, J. E. Mahoney, Peter J. Moore, Jr., Ralph W. Payne, M. K. Ruppert, R. C. Schulze, F. R. Wood.

Pettibone Mulliken Corporation, Chicago; forged steel adjustable rail braces, mechanical switchman, switch stands, spring frog retarder, rerailing frogs, shoulder bolts and guard rail; spring-switch compression gage, cribbing machine; W. A. Blackford, W. F. Brietzke, W. A. Enstrom, L. Harlacher, L. Kelley, E. C. Phillips, E. J. Seifert, G. G. Slibeck, K. Von Kampen, W. E. Weiss.

Philadelphia Steel & Wire Corp., Philadelphia, Pa.; spring washers; W. E. Bugbee, George M. Cooper, George M. Dallas, J. F. Hartley, John E. Hogan, Frank J. Meyer, R. E. Schatmeyer, Stanley H. Smith, L. O. Stratton, C. C. Washer.

Pittsburgh Pipe Cleaner Company, Pittsburgh, Pa.; pipe and sewer-cleaning equipment, pipe lining; W. V. Cross, B. W. Dougherty, G. N. Klesit, E. C. McFadden, L. R. Robinson, R. T. Ruder, R. H. Williams.

Pocket List of Railroad Officials, New York; copies of publication; B. J. Wilson.

Power Ballaster Division, Pullman-Standard Car Manufacturing Company, Chicago; power cribbing machine, power ballaster, models; W. M. Bernhardt, J. M. DuBois, C. B. Faverty, H. E. G. Mulligan, F. H. Philbrick, H. D. Richardson, Robert Sloan, James J. Trant, Peter Young.

Punch-Lok Company, Chicago; air-brake hose applicator; E. J. Govanus, L. G. Horvath, L. A. Kaye, C. H. McKee, D. S. McKinney, Esther T. Mullen, R. F. Novy, John Ekern Ott, R. E. Tatham, H. M. Thomas.

R

Racine Tool & Machine Co., Racine, Wis., portable rail saw, unit tie tamper; G. W. Christiansen, R. B. Hill, E. R. Larson, E. R. Mason.

Rail Joint Company, New York; models of standard, compromise and insulated joints, insulating fiber, literature; W. J. Acker, V. C. Armstrong, Alex Chapman, Geo. Clodfelter, E. A. Condit, H. L. Emerson, J. A. Greer, R. W. J. Harris, Sam Harrison, H. C. Hickey, E. C. Johnson, Jr., H. L. Lansing, G. H. Larson, J. N. Meade, T. I. Moore, R. W. Payne, Thomas Ryan, J. A. Sadler, E. F. Schermerhorn, J. E. Sporre, F. R. Wood, F. R. Wood, Jr.

Railroad Accessories Corporation, New York; power track wrench; B. A. Lundy, Sr., B. A. Lundy, Jr., E. H. Sockwell, M. R. Waller.

Railroad Equipment Magazine, New York; copies of publication; John C. Broderick, M. A. Brown.

Railroad Products Company, Cincinnati, Ohio; water columns, oil columns, sanitary hydrants, switch stands; Otis B. Duncan, Dan J. Higgins, Gordon L. Hiner, F. J. McDonough, Jas W. McGarry, Henry E. Vogel, Ben Wickemier.

Rails Company, New Haven, Conn.; compression-type rail anchors, bridge tie anchor, switch heaters, snow melters, automatic switch-point lock; R. E. Bell, R. H. Bell, L. T. Burmel, L. E. Flinn, F. W. Gle, F. W. Holstein, W. A. Peck, J. V. Wescott.

Railway Maintenance Corporation, Pittsburgh, Pa.; rail-point packing, literature, motion pictures showing the ballast mole in action; movies of crib cleaner & mole, mole, joint packing; Max Bauer, John F. Casey, Jr., C. L. Fester, R. M. Jenner, J. J. King, J. B. McWilliams, J. E. Mountford, E. J. Powell.

Railway Maintenance Devices Company, Morton Grove, Ill.; tie puller-pusher; Arthur Lange, Herbert Ostrander, C. J. Tellin, C. L. J. Welch.

Railway Purchases & Stores, Chicago; copies of publications; J. P. Murphy, Jr., K. F. Sheeran, Edward Wray.

Railway Track-Work Company, Philadelphia, Pa.; rail grinders, track drill; R. E. Bell, W. D. Hoffman, Leon Hunt, John B. Moore.

Reade Manufacturing Company, Jersey City, N. J.; weed killer, model of chemical spray car, literature, smaples of powdered aluminum, concrete-waterproofing and termite-proofing compounds, city-gas and propane switch heater; G. F. Carpenter, D. M. DeWitt, Tom Moore, C. A. Parish, F. Reade, Charles F. Reade, Leonard J. Reade, J. E. Stalzie, W. L. Tanner.

Ric-Wil Company, Cleveland, Ohio; foilclad insulated pipe units for refrigeration piping, steam, process-liquids, and water piping; Walter L. Bartel, B. B. Harter, L. P. Lang, H. W. Roskilly, P. W. Stickney, H. A. Wicks, W. F. Wustmann.

Rodgers Hydraulic, Inc., Minneapolis, Minn.; hydraulic presses; R. D. Allyn, L. W. Brown, S. B. McClocklin, T. E. Rugg.

Rust-Oleum Corporation, Evanston, Ill.; photos of Rust-Oleum applications, other practical uses; Waldo E. Bugbee, Walter J. Church, Walton R. Collins, W. W. Fetner, H. F. Jorgensen, E. W. Kush, C. E. Murphy, Frank B. Nugent, Robert L. Nutt, Jr., J. C. Simmons, Frank M. Sweeny, John N. Thorp, F. O. Walsh, J. M. Welles.

S

Schramm, Inc., West Chester, Pa.; crawler compressor, tractor-mounted compressor pneumatic tie tampers; William Lake, Gordon Norden, F. Elton Weikel.

Simmons-Boardman Publishing Corporation, Chicago; copies of publications; C. M. Burpee, M. H. Dick, R. E. Dove, W. G. Downie, N. V. Engman, S. W. Hickey, N. D. Howard, C. R. Knowles, F. C. Koch, J. G. Little, H. E. McCandless, H. H. Melville, C. W. Merriken, Jr., H. E. Michael, G. A. Murphy, Jr., F. W. Smith, W. L. Turner, Jr., W. G. Vanderpool, J. S. Vreeland.

Sperry Products, Inc., Hoboken, N. J.; model of detectory car, literature on Sperry rail service, samples of defective rail; J. M. Dickey, J. W. Dice, H. E. McCurdy, W. P. Morrison, H. F. Motz, S. P. Murphy, S. A. Thompson.

T

Taylor-Colquitt Company, Spartanburg, S. C.; glass laboratory working model of the Vapor-Drying process, literature; W. E. Gadd, D. M. Graves, M. S. Hudson, J. F. Renfro.

Teleweld, Inc., Chicago; literature on service for railroads; H. E. Finley, O. R. Hansen, D. G. Kerwin, C. W. McKee, H. E. McKee, E. J. Payton, W. A. Peck, J. A. Roche.

Templeton, Kenly & Co., Chicago; track jacks, rail expanders, tie spacers, track shifter, tilting-base bridge and track jack, ball-bearing bridge jack, rachet lowering jack, utility tool, center-hole hydraulic puller, hydraulic puller, hydraulic jacks; track jacks for power ballasting; Haig

Dilsizian, R. B. Hill; F. J. Jakoubek, P. H. McManus, E. T. Scott, William Simpson, A. C. Templeton, J. B. Templeton, E. A. Zimmerman.

Thornley Railway Machine Company, Joliet, Ill.; cribbing machine; L. Hasse, F. L. McMillan, E. M. Thornley.

Timber Engineering Company, Washington, D. C.; timber connectors; model of timber building; Frank E. Carroll, Robert L. Fletcher, Laurence P. Keith.

U

Union Metal Manufacturing Company, Canton, Ohio; piling, pile hammer & rig; J. R. Burkey, A. S. Fromm, D. T. Greth, W. A. Porterfield, W. H. Robertson.

Unit Crane & Shovel Corp., Milwaukee, Wis.; self-propelled mobile, crane, R. E. Boyle, A. R. Corbett, H. O. Henwood, J. W. Lenahan, G. W. Mace.

United States Steel Corporation, Pittsburgh, Pa.; rail bonds, bridge rail joints, frogs, crossings, switches, rail braces, crossovers, switch stands, heat treated switch points; O. H. Baker, M. F. Black, E. B. Bockes, J. G. Brooks, G. C. Bruner, J. H. Clark, R. W. Claypool, James F. Duff, H. H. Febrey, L. P. Gibbs, R. T. Lowerre, M. R. Mason, Jr., A. W. McAbee, H. McDonald, R. T. Moore, E. B. Mullen, H. J. Mullin, R. C. Myers, J. A. Reed, J. F. Schmitt, C. T. Siebert, Jr., W. G. Somes, F. B. Sweeney, J. R. Trimble, H. J. Troxel, T. L. Watson, L. B. White.

W

Warner & Swasey Co., Cleveland, Ohio; multi-purpose earth mover; S. F. Beatty, Jr., Michael Hamas, F. M. Paul, Henry Wellman.

Western Railroad Supply Company, Chicago; automatic highway crossing gate, trainspeed check, testing meters, boot legs; uniform timing device, high detector; G. S. Blackmore, A. W. Boorom, H. M. Buck, T. H. Cole, S. E. Gillespie, Godfrey Gort, John Hensel, F. M. Hill, S. Miskelly.

Woodings-Verona Tool Works, Verona, Pa.; track tools, rail anchors, nut locks, springs; G. K. Luyster, R. J. McComb, G. L. McKewin, J. M. Moore, G. M. Snyder, W. H. Woodings.

Woolery Machine Company, Minneapolis, Minn.; Tie cutter, weed burners; W. A. Peck, Jack Thorpe, L. E. Woolery, W. F. Woolery.

LOOKING AHEAD WITH THE RAILROADS

A summary of locomotive and car equipment developments now being undertaken by the Westinghouse Electric Corporation*

By GWILYM A. PRICE
President, Westinghouse Electric Corporation

Until rather recently, the railroads were meeting their needs and their competition with the type of steam motive power that gave birth to the railroads more than a century ago. To be sure, it was a vastly improved machine—bigger, more efficient, more reliable, more economical. However. it still had the basic elements—with both their advantages and their limitations—of the early locomotives. Since improved motive power obviously is at the heart of operating problems and improvements, the railroads have kept everlastingly at their search for better and more useful locomotives.

Historically, the first assist came from the electric locomotive, an ideal form of motive power, whose service records in peace and war have never been excelled. Railroad electrification began shortly after the turn of the century, and great things were expected. These expectations never were fully realized, through significent portions of the nation's most heavily traveled routes are electrified. The reason for this rather limited application is the high cost of the power distribution systems and not of the locomotives themselves, which can be sold for about 60 per cent of the cost of Diesel-electrics. With dwindling fuel supply and rising costs, it is not unlikely that railroad electrification will some day come into its own in this country, as it has abroad.

Meanwhile, progress is continuing here on presently electrified roads. At the direction of the Pennsylvania, our engineers have developed the essential outlines of a new and larger electric locomotive. It is about one-half more powerful than the present largest electric locomotive, and is ideal for the movement of heavy freight traffic. Because all weight is evenly distributed on sixteen axles, each powered by a separate motor, this giant will have great ability to pull heavy loads without wheel slippage. It will enable the railroad to haul its heaviest trains with a single unit and maintain or better present running time.

For it, new motors—smaller, better insulated, and more efficient—have been developed. New transformers have high capacity for a given weight, because they employ the new war-developed silicone insulation that withstands high temperature. Superior transformer steel is used. Electric braking will be employed to hold back trains on descending grades. This new type of locomotive, which can be built in standardized units similar to Diesels, embodies almost a half-century of experience and development by our engineers.

The Diesel-electric, possessing many of the advan-

*An abstract of a paper presented before the New York Railroad Club, New York, on March 18.

tages of the straight electric locomotive, is an extremely attractive type of power unit. It avoids problems incident to water and coal, provides a smooth flow of power, and is capable of long-sustained runs. To the casual observer, the Diesel-electric locomotive has been accepted by the roalroads almost with suddenness. Those in the know, however, realize that during the past 25 years the railroads have been partners with industry in developing and testing and proving this new form of motive power.

Westinghouse has worked closely with and built many thousands of horsepower of electric drives for Baldwin Locomotive Works, Fairbanks-Morse, and more recently for the Lima-Hamilton Corporation. Our company pioneered in the development of high efficiency traction motors, engine starting and loading control, and other basic features which are fundamental in Diesel-electric locomotive design. We were also one of the first to build a high-speed Diesel engine for locomotive road service, but we abandoned the manufacture of engines to devote more time to the development of electrical controls and transmissions.

Today, there are more than 25 million horsepower in electrical transmissions on American transportation systems, and they are being purchased by the railroads at an annual rate of slightly less than 5 million horsepower. At this rate of application, within 10 years' time the electric power in locomotives will exceed that now developed by all the present central station generating plants.

Utilization and complete control of so much mobile power call for betterments in existing apparatus as well as new and specialized equipment requiring constant development. Electric transmission is here to stay, and we expect to contribute to its continued refinement and improved application.

Steam Turbine Locomotives

But the railroads are searching for still different types of motive power, or improvements on older types. Westinghouse is doing its best to aid in that search. With the needs of the coal-burning railroads in mind, our engineers recently have developed and built steam-turbines and drives for two experimental types of steam locomotives.

About three years ago, the Pennsylvania, Baldwin and Westinghouse placed in service a geared-steam-turbine locomotive. In this unit, known as the Class S-2, a conventional boiler supplies power to a 6,900 hp. steam turbine geared to the locomotive axles. This was the fruit of the very successful experience with such drives for ships. This locomotive has been hauling the Pennsylvania's fast passenger trains between Chicago and Crestline, Ohio. No significant weakness has become evident in the only essentially new parts—the steam turbine and drive. The turbine and gear power plant is easy to operate and control, efficiently converts fuel energy to pulling power, and above all is thoroughly dependable. The service has been ample and of such character as to assure our engineers of the suitability of the steam turbine in regular, high-speed freight or passenger use.

Another important new combination is the steam turbine-electric locomotive. Collaborating with Baldwin, we have built for the Chesapeake & Ohio the turbine and electric equipments for three locomotives in which the power is conveyed from the turbine to the rails electrically instead of mechanically. While also using coal as a fuel, this type of locomotive provides the advantages of electric transmission and control and more powered axles. Both turbine and drive have performed satisfactorily during the short time the locomotive has been in operation.

The practicability of the steam turbine and its power transmission has been well demonstrated by these two locomotive types. But if the steam locomotive is to match the efficiency of the Diesel-electric, it is apparent that there must be some marked improvements in the boiler and firebox. We have entered into a major development program with the Babcock & Wilcox Co., to produce an improved type of steam-turbine-electric locomotive utilizing a reliable, efficient, compact, high-pressure, high-temperature boiler. Our Babcock & Wilcox friends are confident that they can build such a boiler.

To produce such a highly efficient, coal-burning locomotive, Westinghouse engineers will apply experience gained from the turbines on the Pennsylvania and C.&O. locomotives, from the several millions of horsepower of turbines built for marine service, and from electrical transmissions on hundreds of electric and Diesel-electric locomotives. In the proposed locomotive using the B.&W. boiler, it is expected that coal consumption will be about one-half that in present-day locomotive boilers. While this development is still in the early stages, it is hoped that a new locomotive will be produced to provide an improved, useful tool for the coal-burning railroads.

Gas-Turbine Locomotives

A still newer loeomotive, built around the gas-turbine, has exciting possibilities. Westinghouse believes very firmly in its future. In fact, we have under construction a 4,000 hp. gas-turbine locomotive. Because we cannot anticipate all the problems that may arise, it is impossible to name a completion date, but we expect to have it running in 1949. This is a logical step in our work with the gas-turbine, which began on December 8, 1941, when at the Navy's request we undertook the development of a jet-propulsion power plant for high-speed military aircraft. Under great wartime pressure, we accumulated in short order a vast body of experience with axial-flow compressors, combustors, and gas turbines.

Long before peace, we determined to transfer that experience to the development of a gas-turbine power plant for industrial and railroad applications. In fact, the prototype unit went on test late in 1946. Since then, this unit has operated satisfactorily over 1,000 hours, including extended periods at temperatures between 1,300 and 1,400 deg. F., temperatures at which ordinary steel behaves like putty. This is made possible by special alloys, some of which were developed in our research laboratories. A large amount of the operation has been in simulated railroad service. No fundamental weakness in any part of the compressor, combustor, or turbine design has appeared. The two new units for the road locomotive will differ from the test unit only in minor improvements.

Following are a few highlights of this power plant,

which is expected to have numerous significant advantages for railroad service: Larger horsepower can be concentrated in small space. The amount of lubricating oil is materially reduced, and the problems encountered with reciprocating engines are eliminated. The gas turbine can burn any kind of liquid fuel. The unit requires no water and has no ash problem. The gas turbine is the essence of simplicity and compactness, and offers unequaled accessibility for servicing. While the fuel economy of the present type is not as good as for Diesel engines, the difference in fuel consumption is offset by simplicity, lack of reciprocating parts, ability to use cheaper fuels, and virtual elimination of lubrication problems. It will make possible the construction of locomotives with two-thrds the weight and one-half the length of Diesel-electrics.

A surprising characteristic is that the power plant develops considerably more power in cold weather than in hot weather. For example, this 2,000-hp. unit is designed to develop full power when the air is at 80 deg. F. On a day when the air was about ten above zero, test instruments showed that the unit was developing in excess of 2,500 hp.

While our first gas-turbine locomotive will burn liquid fuel, we are not overlooking the possibility of making a coal-burning gas-turbine locomotive. For two years we have been conducting experiments with powdered coal combustors and are continuing the research aggressively this year in a new direction. While we cannot say we are yet ready to throw our hats in the air over what we have found, we are going to prove to our satisfaction—and yours, I hope—that a gas turbine either can or cannot burn coal.

Another interesting possibility, which we are exploring with Lima-Hamilton Corporation, is an entirely new form of power plant. They have been experimenting for some time with a new form of gas generator of the free-piston type, which the engineers say will provide extremely high efficiency. Their experience has been sufficiently encouraging for them to ask us to cooperate in the construction of a free-piston, gas-turbine locomotive for trial service. For this, they will provide the gas generator that takes the place of the compressor and combustor on our unit. We will provide a 3,000-hp. gas-turbine, the electric generators, motors, and control. While work on this locomotive has only barely begun, both Lima-Hamilton and Westinghouse are anxious to carry it forward rapidly so that you and we may know the extent of usefulness of this new type of locomotive.

Things are stirring as never before in the locomotive branch of railroading. Never have there been so many new developments, new possibilities by which the railroads can achieve their objective of remaining vigorous and progressive. We are proud to have an important part in all the phases of this program. We also believe that our record of cooperation with the railroads indicates better than words that we have a completely open and impartial mind regarding the value and potentials of any type of motive power.

Electrical Car Equipment

Intriguing as locomotives are, we realize that there is much more to railroading than pulling trains. Many improvements in car equipment have appeared in recent years. We have participated in some and have a development program well laid out for the future. Air conditioning is one active field. We have been experimenting for several years with a new type of air-conditioning system for railroad passenger cars, in which a Diesel-engine generator to supply a.c. power is carried under the car. This power drives hermetically-sealed refrigerant compressors to supply from eight to nine tons of refrigerating capacity. The a.c. system has no belts, pulleys, seals, axle-drive generators or large batteries. Its electric control will be simpler and easier to keep in working order. One such a.c. equipment was in service on the Chicago, Milwaukee, St. Paul & Pacific two years ago. Experience gained with it led to a redesign, which has now been built and tested. We intend to place two such equipments in revenue passenger service on an eastern railroad and a western railroad in time for this year's cooling season. We are preparing to negotiate the sale of such equipments with a number of railroads.

The same engine-driven power plant will make more practical other devices that best use alternating current. These include modern fluorescent lighting, electric shavers, Sterilamps to reduce the bacteria count in cars and to maintain sterile drinking water, and air cleaners of the Precipitron type that keep the car air free of tobacco smoke and dirt.

In cooperation with the Pennsylvania, we have developed and are testing a passenger-car stabilizer. This is an outgrowth of our war experience with gyroscopes for such things as tank-gun stabilization, control of gun turrets, and radar antennas. This car stabilizer will soften the up-and-down motion inevitable at high speed even on well-ballasted track. Also, it provides for automatic banking of the car on curves. It is expected to enable comfortable speed on curves to be increased by as much as 15 to 25 per cent. It should also reduce track maintenance and greatly improve rider comfort.

There is a very real need to meet the rising demands and increasing problems of high-speed suburban and subway traffic with equipments that provide better service, yet are less costly in maintenance. We are contributing to that end with new motors, control and air-cleaning equipment for multiple-unit and subway cars. For M.U. cars we have developed superior equipment, utilizing the experience gained in over four decades of association with this type of service. Motors are smaller, carry overloads better, and require less attention.

As you know, New York City is to have a large number of new subway cars. For many of them we are now producing a new type of electrical equipment which provides dynamic braking with smoother and more rapid starting and stopping. We are also assisting the New York City Transit System in developing its new, ten-car subway train known as the "Super-duper." Among many improvements, it will have fluorescent lighting, Precipitron-cleaned air, and lights that do not go out when the cars pass over a third rail gap.

The sum total of these developments, added to our continued attention to older and more familiar products useful to the railroads, absorbs much of our ablest manpower, our funds and our productive facilities. In addition to large current allocations for research and development, we are presently spending several million dollars in plant expansion to supply only a part of the equipment needed by the railroads. All these things are more than justified by our faith in the railroads' future.

GENERAL NEWS

Ultimatum Handed To Emergency Board

Strike threatened if decision recommends carriers' rules

An ultimatum that they will strike if the presidential emergency board goes so far as to recommend any of the 15 carrier-proposed rule changes was laid down last week by counsel for the three recalcitrant brotherhoods whose demand for a wage increase of 30 per cent and 25 costly rule changes have been before the board since February 2. At the same time, the organizations have refused to discuss the carriers' proposals, stating that they "are just not going to take up their time or concern themselves with proposals of that type." (The proposals of both parties were outlined in *Railway Age* of February 14, page 51.)

Referring to the 15 carrier proposals, which the railroads seek in order to increase operating efficiency and curtail some forms of featherbedding, C. D. O'Brien, counsel for the unions, stated that the organizations "cannot believe the board would seriously consider recommending proposals which, by their very nature, would compel unanimous rejection by the employees and which, if attempted unilaterally by the carriers, could only result in defensive withdrawal from the service by the employees in a body."

This open declaration of the unions' decision to abide by the emergency board's recommendation only if it proves favorable to them came during the twenty-third day of the proceedings, when L. W. Horning, vice-president of the New York Central, appeared as a witness for the carriers in support of their proposal to clarify and standardize the existing overtime rate of pay for enginemen and firemen in passenger service. Counsel O'Brien interrupted Mr. Horning's testimony, addressing the board as follows:

"Mr. Chairman, before Mr. Horning proceeds, I think it might be well, in frankness, to advise the board and the carriers that we are not going to present any evidence or make any contentions in respect to any proposals of the carriers that propose to take away any of the employees' advantageous conditions already enjoyed, and I think I might as well say, in similar frankness, that the organizations are just not going to take up their time or concern themselves with proposals of that type.

"Now, that is not a universal statement, because the carriers have a proposal for determining the time limit on claims as to which we are willing to work but a reasonable and mutually acceptable modification to the existing rule. For example, in these cases where something a little better than one-eighth of a day's pay has been obtained for passenger service overtime, by vigorous negotiations and hard work on individual properties, we are not in the faintest interested in getting something worse than those employees already enjoy."

Referring to the union's implied ultimatum to the board, George E. Bushnell, chief justice of the Michigan supreme court, one of the three board members, directed a question to Mr. O'Brien in subsequent proceedings as follows:

"Can you give me a considered answer to this question: In the light of your statement on the record the other day, it appears that the organizations take the position that they are not interested in any way in the carriers' proposal with respect to changes in rules, and you have been consistent in that position by not even asking any questions, and in some instances I cannot escape the observation that your side of the table has emphasized your position by a complete lack of attention to testimony presented by these carriers.

"Now, I can't understand that viewpoint, and I can't understand why if *you* are seeking changes, *they* are prohibited from seeking changes. This board's power of recommendation is completely emasculated by your attitude. Now, is it that you serve notice on the board that you don't intend to pay any attention to anything we recommend, or is it that we have no right to recommend with respect to the carriers' proposals?"

In reply, Mr. O'Brien stated that "we have not challenged the power of the board to entertain these carriers' proposals and hear the carriers' evidence on them." He failed, however, to reply to the question regarding the intention of the organizations to pay attention to the board's recommendations.

Howard Neitzert, counsel for the carriers, told the board that the railroads believed that, in fairness to all of the employees, the board should recommend the same disposition of both wages and rules as was negotiated between the carriers and the conductors' and trainmen's brotherhood, representing a majority of operating railroad men. In opposition, Mr. O'Brien denied "the right of any other labor organizations to legislate conditions of employment for the people represented by these three organizations."

Where Does the Public Stand?—"Suppose this *impasse*," Judge Bushnell queried Counsel O'Brien, "reaches the point where you resort to your strike weapon. Haven't they (the carriers) got the right to resort to an abandonment of service, or an attempt to abandon service, and say it has reached a point in the railroad administration where they can no longer discharge their duties to their stockholders and their investors, and they cannot continue longer? What is going to happen to the public if this thing just keeps on this ascending scale?"

"I am certainly not prepared to answer that," the union officer replied, "but I certainly concede the public has an interest here, and it must be expressed by you three members of the board. I think the public is very ably represented here in the membership of this board." Judge Bushnell took exception, pointing out that the board could not very well represent the public if the unions continued to ignore the testimony presented by the carriers in behalf of the latters' proposals, thus giving it but one side of the proposition.

Mr. O'Brien expressed the opinion that the carriers' treatment of their 15 proposals in the settlement with the conductors and trainment "confirms the judgment of the organizations that those proposals were advanced as negotiable 'counterweights' to pressure the organization into abandonment of warranted demands." His charge was the opposite face of testimony introduced a few days previously, wherein a carrier witness charged that the unions' rule proposals had been little more than a "tactical club" to obtain more favorable wage settlements than in the wage and rule cases before the 1941, 1943 and 1946 emergency boards.

The White House has approved an extension to March 27 of the time within which the emergency board is required to file its report and recommendations.

"The questionable advantages that may flow to any group of railway employees through the imposition of make-work and featherbed rules are achieved at the expense of the cooperative groups of employees and at the expense of the public," Howard Neitzert, counsel for the railroads, told a subsequent session of the emergency board. He asserted that "if the general public knew the cost to it of the make-work and feather-

bed rules and practices that have been imposed upon this industry, it would insist upon immediate corrective measures," and told the board he hoped the public would become aware of this situation before corrective measures would be too late. If the unions' demands continue, Mr. Neitzert said, railroad employees will be paid "double pay for working, and guaranteed payments for not working." He suggested that there were already too many rules governing the working conditions of railroaders, and because many of them are unnecessary, they breed disputes, litigation, more rules and more litigation.

In his closing argument in behalf of the unions, their counsel C. D. O'Brien referred to the director general of the World War I United States Railroad Administration as a "good fairy" who had granted time and one-half for overtime to crews in freight service. "I guess we will have to ask this board to be the next fairy," Mr. O'Brien said in referring to the unions' plea for overtime at time and one-half in passenger service. (Passenger engineers and firemen in road service currently are paid on a dual basis, receiving straight-time overtime for more than 100 mi. run, or 5 hr. worked, in any one day.) "The engineers, firemen and switchmen," Mr. O'Brien told the board, "place their living present and their dynamic future in your hands. They confidently expect recommendations that they may accept, recommendations which meet their needs and recognize their legitimate aspirations."

The emergency board proceedings were concluded on March 10 after 33 days of hearings.

Aviation Policy Board Reports to Congress

92 recommendations include many relating to commercial aviation

Retention of the Civil Aeronautics Act's present provisions with respect to the participation in air transportation by carriers other than air carriers, regulation of charter and contract operators of transport aircraft and "early consideration" by Congress of the reduction or repeal of the tax on amounts paid for transportation, and the transport by air, at the first-class rate, of that mail which can be "appreciably expedited" by air carrier, are among the 92 recommendations embodied in the recently issued report of the so-called Joint Congressional Aviation Board.

The board, of which Senator Brewster, Republican of Maine, is chairman, and Representative Hinshaw, Republican of California, is vice-chairman, was created by Congress last year because of "public concern over the threatened bankruptcy of the aircraft industry and the civil air carriers and their importance to national security." Its bipartisan membership included 19 members of Congress and an "advisory council" representing the "top leadership" in the aircraft industry. Representatives of the armed forces and various government agencies sat with the board in its executive sessions.

Beyond setting it out, the board failed to comment on its recommendation that the Civil Aeronautics Act should be left undisturbed in so far as it pertains to the participation in air transportation by carriers other than air carriers. In this connection, President Truman's Air Policy Commission, in a report made public earlier this year, contended that surface carriers desiring to develop air-transport services as part of coordinated operations should not be automatically prevented from doing so "simply on the grounds that they are surface carriers—as now appears to be the case" (See *Railway Age* of January 17, page 52).

Would Enlarge Authority—On the subject of charter and contract operators of transport aircraft, the board recommended that the act be amended so as to give the Civil Aeronautics Board the same regulatory authority over such carriers that it has over certificated carriers "Need for safety and economic regulation of the contract carrier now performing types of service similar to that of certificated air carriers is apparent," the board declared.

In recommending that Congress should give early consideration to the transport by air, at the first-class rate, of that first-class mail which can thus be "appreciably expedited," the board stated that Congress, in its considerations, should "weigh the public benefits of such a transfer against the added costs involved." Commerce and trade, it said, would "benefit materially" from having all long-haul first-class mail go by air when it could be materially expedited thereby.

At the same time, however, the board noted that, according to the Post Office Department, the proposed transfer of all long-haul first-class domestic mail to air would reduce the first-class mail profit to approximately $16,000,000. "Hence," it continued, "the net Post Office deficit would be increased by $96,000,000 and would have to be made up by increased appropriations. Because most of the present railroad space would be retained by the Post Office Department, the estimated loss of revenue to the railroads would be less than $5,000,000 per year."

The board also said that the date for initiating such proposed service should be determined by recommendations from the Post Office Department.

Certificated domestic air carriers, it said, haul approximately 33,000,000 ton-miles of air mail per year, or about 10 per cent of the total long-haul first class mail. The Post Office Department, it went on, has estimated that the volume of air mail would be about 179,000,000 ton-miles per year if all long-haul first-class mail which it estimates could be expedited by air were to be transferred to air carriage. "The air carriers," It stated, "would receive about $47,000,000 more mail pay per year, assuming an average of 45 cents per ton-mile. This benefit to the air lines, however, must be balanced against the added cost to the Post Office."

Likes Air Parcel Post—The board also recommended that appropriate legislation should be enacted for establishment of domestic air parcel post, at reasonable experimental rates, subject to revision when more nearly accurate costs of carriage can be ascertained. The board said that such a step, in addition to providing a new public service of "great value," would aid national security by adding to the present fleet of civil transport aircraft.

"The Post Office Department should determine rates to assure adequate ground facilities at airports and other handling procedures," the board said. "Small packages sent by air express or air freight at present are comparatively costly because excessive handling is required. Bag handling of parcel post in volume will reduce such costs. An estimated 100,000,000 ton-miles of air parcel post is expected to move during the first year of operation. This is three times the present volume of first-class air mail."

Another board finding recommended that no action should be taken to separate the subsidy pay from the mail service pay until the air transport industry reaches more nearly "self-supporting questions." The board said that separation of the subsidy would be an "extremely complicated matter" and that probable delays resulting might cause "serious difficulty" to the "need" carriers, with possible failure and denial of service to the public. "This would be in violation of the spirit of the act and for the present could do more harm than good," the report continued. "In view of the current financial condition of the industry, the board does not feel that this is the time to make such a subsidy separation. When the air lines are on a sounder financial foundation, consideration can then be given to such a procedure."

According to the board, stable government operating policy is one of the greatest needs of present-day aviation Only through a continuing, but firm government policy, capable of ready adjustment to changing circumstances, is said, can the stability which the aviation industry requires be achieved. Although it described as "sound" the basic existing governmental structure, the board listed as necessities (1) an adequate statutory basis for interagency coordination and cooperation; (2) clari-

fication of overlapping responsibilities and elimination of "bickering" that it finds between the Civil Aeronautics Authority and C.A.B. and their staffs; and (3) an independent agency concerned with safety to investigate aircraft accidents.

A New Bureau—Other recommendations pertaining to government organization would transfer the administration and enforcement functions of the C.A.A. relating to aircraft and airmen to the C.A.B., with the operative functions of the former to remain in the Department of Commerce. The C.A.A., it said, should be abolished and an "Office of Civil Aviation" be created in the Department of Commerce. The director of civil aviation would be the senior operating officer and would report to an assistant secretary of commerce.

As for the C.A.B., the board also recommended, among other things, that it should continue as an independent quasi-legislative and quasi-judicial agency and be charged with the administration of the economic responsibilities imposed by the act. The C.A.B., it added, should be freed of its present administrative ties to the Department of Commerce and the salaries of its five members should be increased to the present statutory limit of $12,000 annually.

The board also recommended that Congress support, in the form of appropriations, a nine-year research and development project which would provide, at an estimated cost of $75,400,000, for the installation of an "ultra-modern all-weather navigation, landing aids and airways traffic-control system." Authorization of funds should be made for the first year's portion of the program, it said, with an endorsement to future Congresses and recommendations that they continue appropriations to the completion of the program.

The board predicted that the commercial air lines will lose approximately $40,000,000 in fiscal 1947-48 due to air-traffic-congestion delays, flight cancellations and schedule unreliability. "If the air-traffic-control system remains essentially unchanged, the loss that could be expected during the next 15 years would amount to more than $600,000,000," it continued, adding that adoption of the plan will enable the air lines to increase their on-time schedules from the present 45 per cent to 95 per cent.

The board also found that the development of policies dealing with air cargo, contract flying and charter service in the transport field is a matter of "great importance" to the national economy. "The rapid increase of air cargo has pointed to the existence of a tremendous potential development," the report stated. "Within the past two years, the dramatic rise of cargo carried by air has been marked by an increase from 60,000,000 ton-miles carried in 1946 to 100,000,000 ton-miles in 1947. While the development of air cargo is significant from the standpoint of interstate and foreign commerce, the increase in all civil air operations, including cargo, contract and charter flying, is important to the national security because of the reservoir of aircraft and trained personnel it creates, which can be utilized by the military in time of emergency."

Among other conclusions reached by the board were that (1) the entire airport program should be reviewed by Congress "with a view toward providing a system of airports more closely keyed to the needs of a sound air-transport industry, civil aviation, postal service and national security"; (2) joint military-civil use or airports and airways should be extended; (3) the C.A.B. should encourage action by the air carriers to achieve overall economies by such cooperative arrangements as jointly-operated ground services and consolidated ticket offices; (4) experimental feeder line certification should be on a five-year instead of three-year basis "to aid in financing such operations"; and (5) the adoption and continued use of a single formula for the allocation of taxes in interstate operations "should be insured by federal legislation" in order to prevent "multiple air line taxation by states or localities."

Prescibes New Split of East-West Rates

Six complaining western roads get modified divisions plan

The Interstate Commerce Commission has prescribed new bases for divisions of rates between eastern railroads generally and six western roads which refused to subscribe to the apportionment plan that was agreed upon in 1939 by other western roads and the eastern lines. The western roads to which the prescribed basis will apply, as it will to certain of their short-line connections, are the Chicago Great Western; Chicago, Rock Island & Pacific; Kansas City Southern; Missouri-Kansas-Texas; Missouri Pacific; and St. Louis-San Francisco.

The commission's report, which drew dissents from Commissioners Miller, Splawn and Mitchell, was in No. 28277, embodying the nine-year-old complaint of the six dissatisfied western roads, and the related No. 25589, embodying a complaint (in the nature of a cross-complaint) wherein the eastern roads alleged that the complainants in the title case were already receiving unjust, unreasonable and inequitable divisions. The proceedings have been the subject of two proposed reports, the latest by Examiner Howard Hosmer having been noted in the *Railway Age* of December 7, 1946, page 971.

Plan Effective 16 Years—The divisions involved are those of the joint class rates between Official and Western territories, prescribed in *Western Trunk Line Class Rates,* 164, I.C.C. 1, and supplementary commission decisions, the basic adjustment having become effective more than 16 years ago, on December 3, 1931; and of joint through commodity rates which bear percentage or column relationships to the interterritorial class rates. Also involved are divisions of certain combination rates constructed of aggregate-of-intermediate commodity rates, principally those on fresh meats from Western Trunk Line to Official territory; and the incidence of river-crossing charges at St. Louis, Mo. Removed from the complaints by agreement of the parties were the divisions of rates on grain, grain products, livestock, lumber, and petroleum and its products, in carloads eastbound, and of rates on automobiles, coal and coke, in carloads westbound.

Among other conclusions of the commission are those to the effect that there was no basis for finding that western roads were entitled to increased divisions in recognition of greater revenue needs than those of eastern roads; and that the evidence failed to show that the operating costs of the six complaining western roads exceeded those of the eastern lines "to such an extent, if any, to justify relatively higher divisions." Generally, the divisions basis prescribed in the report, as to the single-factor class and percentage or column rates, seems to be less favorable to the six western roads than the basis about which they complained. Tending to offset that, however, will be the more favorable divisions to those complainants out of the aggregate-of-intermediate commodity rates, and the relief they will get with respect to river-crossing charges at St. Louis.

Dissenter Miller, with whom Dissenter Mitchell agreed, protested that the majority report will result in "confusion and dissatisfaction" because it will leave in effect two bases for divisions—the prescribed basis for the complaining western roads and the agreed basis for other roads in that territory. These commissioners would have dismissed the complaints. Dissenter Splawn noted that hearings in the case were held in 1939, and thus he thought there should have been further hearing to bring the record down to date. Commissioner Barnard did not participate in the disposition of the case.

Minority Group—Tracing the history of the controversy, the majority report noted that prior to the establishment of the joint class rates prescribed in the *Western Trunk Line* case, the class rates between Official and Western territories were made by combination. Thus there was in 1931 no established basis of divisions which could be applied to the newly-prescribed joint rates, and the revenue therefrom for several years was settled, as the report put it,

"in accordance with the conflicting views of the lines which collected the charges." Effective April 1, 1935, the two groups of roads agreed on a temporary uniform basis under which divisions were based on a first-class-rate prorate, using as factors the first-class rates between the point of origin or destination and the point of interchange but deducting one percentage point from the western division and adding one point to the eastern divsion.

In December, 1938, the eastern roads and the western lines except the six omplainants in the title case, agreed on a permanent basis of divisions which become effective October 1, 1939. It was applied retroactively to December 3, 1931, in accordance with the terms of the contract governing the temporary basis. The permanent basis has become known as the "500-A divisions," but the six dissatisfied western roads refused to accept it and filed their complaint a few months after it became effective. Where they have collected the revenue, they have continued to apply the temporary basis, while the eastern roads have applied the 500-A divisions in splitting their collections with the six dissenters.

Under the 500-A basis, rates on l.c.l. are divided in accordance with the method fixed by the temporary basis. Single-factor carload rates are divided by a modified mileage prorate under which the western factor is the short-line distance between the interchange point and the western point of origin or destination, inflated 25 per cent, plus 120 miles as a terminal element; and the eastern factor is arrived at in the same way but with no inflation. (The western inflation factor is not applied in dividing rates to and from extended zone C.) The 500-A basis further provides for the use of actual interchange points as dividing points, and on traffic which crosses the Mississippi river between St. Louis, Mo., and East St. Louis, Ill., the latter is considered the interchange and dividing point, thus leaving the river-crossing charges on the western lines. There is also provision for a minimum primary division of 15 per cent.

With respect to the aggregate-of-intermediate commodity rates, the 500-A basis provides that where the factors of such rates apply to and from point of interchange, the rates will be divided as made. Where the rates on such shipments are made by combination of rates to and from points which are not points of interchange, or where the combination rates are based on routes other than the route of movement, the basis of divisions applicable to carload shipments on single-factor rates, as described above, is applied—subject to the application of local rates to and from points of interchange as maxima.

Objection to Mileage Basis—Before proceeding to prescribe the new divisions basis, the commission stated that the six dissatisfied western roads had attacked "various features" of the 500-A basis "without proposing specifically any definite system as a substitute." Meanwhile, the final position of the eastern roads was described as one favoring the 500-A basis. Of the 500-A basis, the commission said generally that while the 25 per cent inflation of distances in western territory might seem to weight it in favor of roads there, this advantage is "largely offset" by the fact that for the most part the hauls in eastern territory are longer, and thus eastern roads "benefit from the rapid progession in a mileage prorate."

The report proceeded to observe that the commission saw "merit" in complainants' criticism of the 500-A basis on the ground that it is based on the principle of a mileage prorate. The pattern of this mileage prorate, it continued, is to a "considerable extent" the same as that "considered and rejected" by the commission in *Southwestern- Official Divisions,* 234 I.C.C. 135. The new scale prescribed in the report was described as one reflecting the progession observed in the construction of class rates between Western and Official territories which was prescribed as an interim adjustment in the No. 28300 class-rate case. Meanwhile, 500-A's provision fixing the minimum division at 15 per cent is adopted.

The prescribed scale, as set out in an appendix to the report, has a single set of divisional factors, applicable to both eastern and western roads, when traffic moves on single-factor rates between Official territory and zone 1 of Western Trunk Line territory. Where the point of origin or destination is in another zone of Western Trunk Line territory, a scale of factors 10 per cent higher will apply to the western haul. The divisional factors are set up in 50-mile blocks, the table in the report being carried up to 1,200 miles with the stipulation that it is "to be continued, if necessary, at the same rate of progression."

Aggregate-of-Intermediates — With respect to revenue from shipments subject to aggregate-of-intermediate rates, which are interchanged at the rate-making points, the commission ordered that the rates be divided as made, i.e., "by allowing each carrier or group of carriers its respective rate which constitutes a component of the aggregate rate."

It then proceeded to deal with shipments moving on aggregate-of-intermediate rates, which pass through the rate-making points but are interchanged at other points—such as shipments subject to aggregate-of-intermediate rates made by combination on upper Mississippi river crossings, which are interchanged at Chicago or Peoria, Ill. In such cases, the commission ordered that the western roads be allowed their rates which constitute that component of the aggregate applying west of the rate-making point, and in addition a share of the eastern component for the haul from the rate-making points (the river crossings) to the points of interchange. This share is to be determined in accordance with the prescribed scale for single-factor rates—except that factors for hauls from river crossings to Chicago and Peoria are fixed at 46 and 34, respectively.

In fixing these Chicago and Peoria factors, the commission rejected that feature of the 500-A basis which makes the local rates to and from point of interchange the measure of maximum divisions on this combination-rate traffic. That provision, the report said, had come into play "chiefly as a limitation on the western lines' share of the revenue from fresh meats," because rates on such traffic from producing points in Western Trunk Line territory to Chicago and upper Mississippi river crossings are "relatively low." This phase of the report prompted Commissioner Patterson to file a brief "concurring" expression in which he said he would have preferred to find "that the division any carrier might receive should not exceed its local rate to and from the same points."

With respect to the third class of shipments moving on aggregate-of-intermediate rates—those which do not move through points on which the aggregate rates are made—the commission ordered divisions "on a rate prorate using as factors the rates which would be applicable as components of aggregate rates via the point of interchange in the absence of lower combinations via another gateway." As to the river-crossing charges at St. Louis, it is provided that when an intermediate switching service is necessary there, the applicable charges of the intermediate switching carriers shall be paid out of the eastern divisions when the shipment is delivered by an eastern carrier to a western carrier, and out of the western division when the shipment is delivered by a western carrier to an eastern carrier.

The order accompanying the report requires the roads affected to establish the prescribed set-up by July 1, and no retroactive adjustment is required. The order also contains a proviso stipulating that the roads may establish groups of points on origin or destination in either territory and base the percantages "on fair average distances between such groups and the points of interchange"; and "for purposes of convenience and simplicity" they may "deviate in other respects from the strict letter" of the finding setting out the prescribed basis —"if they so agree."

Speed Up Chicago-Coast Trains

Effective on February 29, the scheduled running times of the "City of Portland" and the "Los Angeles Limited", operated by the Chicago & North Western and the Union Pacific between Chicago and the Pacific Coast, were reduced. The "City of Portland" now departs from Chicago at 6 p. m. instead of 4:55 p. m., but continues to arrive at Portland at 8 a. m. on the second day.

Eastbound, the "City of Portland" continues to depart from Portland at 5:30 p. m., but is scheduled to arrive in Chicago at 11:50 a. m. instead of 12:30 p. m.

The "Los Angeles Limited" continues to depart from Chicago at 12:01 p. m., but is now scheduled to arrive at Los Angeles, Cal., at 10:40 a. m. on the second day, instead of 11:10 a. m. The eastbound schedule of this train remains unchanged.

In addition, the North Western has announced that its Chicago-Omaha train No. 13 now departs from Chicago at 9:15 a. m. instead of 8:45 a. m. and is scheduled to arrive in Omaha at 9:45 p. m. instead of 9:30 p. m.

A.A.R. Denies F.R.P.'s Anti-Trust Bill Charge

Did not make 'false statements' on Bulwinkle measure Fort says

Charges made last week by William C. MacMillen, Jr., president of the Federation for Railway Progress, that the Association of American Railroads has distributed "false statements" about the Bulwinkle bill to stay the operation of the anti-trust laws with respect to carrier rate-making procedures and other joint actions approved by the Interstate Commerce Commission, have been denied by J. Carter Fort, vice-president and general counsel of the A.A.R. Robert R. Young, chairman of the Alleghany Corporation and Chesapeake & Ohio, also holds the same position with the federation.

Mr. MacMillen's allegations were sent out in a March 12 telegram addressed to William T. Faricy, president of the A.A.R., in which he called upon the latter organization to correct certain "false and damaging statements" in the interests of the "entire railroad industry and the public welfare."

Unanimity Challenged—"The Association of American Railroads," Mr. MacMillen said "is distributing a booklet entitled 'Face to Face across the Table' which contains false statements about the Bulwinkle bill. On behalf of the 15,000 members of the federation . . . I request that you promptly correct them. The booklet falsely states, 'The unanimity of support for this legislation is perhaps unprecedented in modern experience with so important an issue. As shown by the hearings, all interests, governmental and private, which are directly responsible for, or concerned in, or affected by transportation are agreed that the bill should become law.'" In this connection, he listed several government agencies and private organizations which, he said, are agreed that the bill should not be enacted. Among the groups named were the Department of Justice, Department of Commerce, Brotherhood of Railroad Trainmen, National Farmers Union, the National Federation of Small Business, and the New Council of American Business, in addition to the C. & O. and federation.

"The clear implication from this booklet is that the Bulwinkle bill deals only with rate conferences," Mr. MacMillen continued. "As you well know, this bill would serve to permit railroads, with immunity from the anti-trust laws, to agree with each other not to compete on such matters as service, equipment and schedules. This bill would, in fact, serve to exempt the railroads from the operation of the anti-trust laws. Yet no mention is made of this in your booklet. I think it important in the interests of the native railroad industry and the public welfare that the association . . . correct these false and damaging statements."

In a March 13 letter addressed to Mr. MacMillen, Mr. Fort, who said the telegram had been referred to him for reply, observed that, despite the opposition of the C. & O. and federation to the bill, the C. & O., through its president, R. J. Bowman, has "taken a position favoring the clarification of the law with respect to rate conferences, which is the principal purpose of the bill."

Quoting Mr. Brown—"In an address before the Atlantic States Shippers Advisory Board on January 14," Mr. Fort went on, "Mr. Bowman said: 'We realize that the making of agreements among railroads regarding rates is not only desirable but also necessary. . . We recognize the need for clarification of the present state of the law so as to remove doubts concerning the sphere within which railroads, acting through rate bureaus, may confer, collaborate and reach agreements about rate matters. We are not opposed to legislation that will provide such clarification. To the extent that the Bulwinkle bill . . . provides such clarification, I think it is fair to say that there is no point in difference between the position of this shippers board and the position of the Chesapeake & Ohio.'"

Mr. Fort also called attention to the July 25, 1947, report of the House committee on interstate and foreign commerce, which, he said, observed that "the bill has the virtually unanimous support of all those directly interested in transportation, including commissions, both federal and state, charged with the responsibility of regulating transportation, carriers of all kinds, and shippers throughout the country, including commissions, both federal and state, charged with the responsibility of regulating transportation, carriers of all kinds, and shippers throughout the country, including industrial, agricultural and livestock interests." He also cited the June 27, 1947, testimony of Colonel J. Monroe Johnson, director of the Office of Defense Transportation, and a member of the Interstate Commerce Commission, who, according to Mr. Fort, told the same House committee that "the unanimity of those interested in and with knowledge of transportation in favor of this legislation is perhaps unprecedented."

"Your statement that the bill would serve to permit railroads to agree with each other not to compete on such matters as services is incomplete and misleading," Mr. Fort concluded. "You ignore the fact that the bill would not permit the railroads to enter into an agreement with respect to services or anything else unless the agreement has been approved by the Interstate Commerce Commission, after full hearing, and upon a finding of fact that the agreement is in furtherance of the National Transportation Policy. Thus the bill would afford complete and effective protection to the public interest by means of supervision and control by the governmental body.

"You object to our pamphlet on the ground that it is devoted chiefly to the rate conference agreement feature of the Bulwinkle bill. Our pamphlet places emphasis on this feature, to which Mr. Bowman referred with approval . . . because it is by far the most important feature of the bill and the one in which we are primarily interested."

As reported in *Railway Age* of June 21, 1947, page 1252, an amended version of the original Bulwinkle bill passed the Senate by a 60-to-27 vote last June 18. The measure, S.110, was sponsored by Senator Reed, Republican of Kansas. The House committee thereafter held hearings, but did not file its favorable report with the House until last July 25, the day before the final meeting of the session. That report, however, was not on the Senate-approved S.110, but on an amended version of the similar bill (H.R.221), introduced by Representative Bulwinkle, Democrat of North Carolina. No further action has been taken in the House during the present session.

Crandall Retires; Edwards Heads Enlarged I. C. C. Accounts Bureau

Dr. Ford K. Edwards, head cost analyst of the Interstate Commerce Commission's Bureau of Transport Economics and Statistics, has been appointed director of a new Bureau of Accounts and Cost Finding, which the commission set up on March 7 as successor to its Bureau of Accounts. Clyffe D. Crandall, who had been director of the Bureau of Accounts, retired on February 29, and on March 1 the commission adopted an order giving that bureau its new name and transferring to it the cost-finding section which Dr Edwards had headed in the Bureau of Transport Economics and Statistics and the section of accounts which had been in the Bureau of Motor Carriers. The order, which carried a March 7 effective date, was published in the March 5 issue of the Federal Register, and the announcement of Dr. Edwards' appoint-

ment to the directorship of the enlarged bureau was made on March 10.

The announcement included an outline of Dr. Edwards' career, which said that he attended Iowa State College, receiving a degree in engineering; and he subsequently spent three years in graduate work in the field of transportation economics at Yale University, receiving a Ph.D. degree.

He spent two years in the operating and traffic departments of the Nebraska Bell Company and American Telephone & Telegraph Co., approximately three years in the operating and maintenance departments of the Union Pacific and Pennsylvania, and three years in the traffic and operating departments of the Motor Transit Company at Los Angeles, Calif., and the Pacific Greyhound Lines.

For five years Dr. Edwards was assistant professor of transportation and public utilities at the University of Southern California. From 1937 to 1938 he served as chairman of a California State Chamber of Commerce's transportation committee which drafted a statewide program of motor carrier regulation.



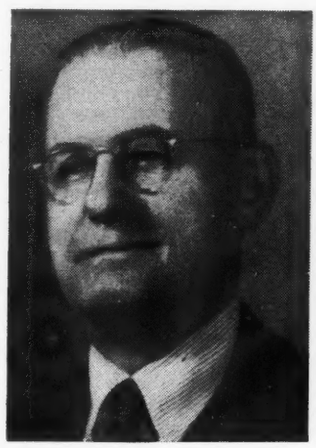
Ford K. Edwards

For four years he was principal economist and examiner with the California Railroad Commission in work largely devoted to cost investigations in the field of rail, highway, water carrier, interurban and marine terminal operations. He is the author of a book entitled "Principles of Motor Carrier Transportation" and of a number of papers presented before various economic groups.

In 1939 Dr. Edwards joined the staff of the newly created Cost Section in the Bureau of Statistics as principal economist in charge of the design of cost procedures. Since 1942 he has been head cost analyst in charge of the Cost Finding Section.

Mr. Crandall had been director of the Bureau of Accounts since June, 1941, and had been connected with that bureau at different times since 1914. He was born February 16, 1878, at Colusa, Cal., and began his career in 1896, with the Spokane Falls & Northern (now part of the Great Northern) at Northport, Wash. He remained with the road until 1904 when he became cashier and chief clerk in the accounting department of the Great Northern Steamship Company at Seattle, Wash.

Leaving that position in 1907, he was during the next few years successively with Copper River & Northwestern in



C. D. Crandall

Alaska, the Oregon-Washington, and the Bellingham Bay & British Columbia. He resigned as auditor of the latter at the close on 1913 to begin in January, 1914, his first period of service with the I. C. C. as examiner in the Bureau of Accounts. Mr. Crandall remained in that position until June, 1918, when he became an assistant in the office of the director of finance, United States Railroad Administration. Eight months later, in February, 1918, he resumed his position of examiner in the Bureau of Accounts, remaining until May, 1920, when he resigned to accept a position as auditor for the railroad department of the Pierce Oil Company, St. Louis, Mo.

A few months later, in September, 1920, Mr. Crandall returned to the commission's service as an assistant in the Bureau of Finance; and he was assistant director of that bureau from May, 1922, until May, 1924. At the latter time Mr. Crandall again left the commission to become comptroller of the Manila Railroad Company at Manila, P. I. He resigned from that position in November, 1930, and in March, 1931, he became chief accountant in the Report Section, Bureau of Accounts. Thereafter he remained with that bureau until his retirement, serving as assistant director from August, 1938, until his apointment to the directorship in June, 1941.

Must Cancel Pullman Tickets From Florida a Day Earlier

Tickets for sleeping car accommodations from Jacksonville, Fla., and points in Florida south thereof, to destinations in other states west and northwest of Florida, must now be canceled not later than the second day preceding the day of departure of the train for which sold, if the passenger wishes a refund on the ticket. This new regulation, placed into effect by the Pullman Company on March 10, will continue in effect until May 15, 1948.

In announcing the change, Pullman stated that "a large amount of desirable sleeping car space has been tied up" by outstanding tickets that "generally are not returned for cancellation until a short time before the train departs." The day-earlier cancellation rule, the company said, should remove the cause for complaints and charges of irregularity in the disposal of accommodations and afford opportunity for a more orderly disposal of accommodations during the peak of the northbound Florida season.

Reports on Accidents

Three recent accidents, which resulted in deaths of three passengers and one employee and injuries to 178 passengers, 18 employees and three railway-mail clerks, were caused by a broken rail, failure to control the speed of a following train in accordance with signal indications, and failure of a superior train to obey a wait order, according to reports on Interstate Commerce Commission investigations conducted under the supervision of Commissioner Patterson.

The broken-rail accident was a derailment, which occurred December 28, 1947, on the Burlington-Rock Island near Corsicana, Tex., and resulted in the death of one passenger, and the injury of 171 passengers, five dining-car employees and one baggageman. Transverse fissures were found in the broken sections of the rail; and the commission's report stated that a rail-detector car, operated over the line on July 3, 1947, indicated a defect at the location of the first break, the same indication turning up again on the tape when a re-run test was made. "However," the report added, "no hand test was made, as it was thought the indication was caused by the presence of grease on the rail, and the tape was stamped accordingly."

The point of the accident, four miles south of the station at Corsicana, is on that part of the Burlington-Rock Island's so-called Joint Texas division which extends from M.K.T. Junction, Tex., (near Waxahachie) to Teague—67.3 miles of single-track line over which trains are operated by timetable and train orders, there being no block system in use. The 90-lb. rail which broke was manufactured by the Colorado Fuel & Iron Co. during 1929 and laid new in July of that year.

Lightweight Equipment—The train involved, No. 3, was a southbound first-class passenger train consisting of a Diesel-electric locomotive and six cars of lightweight all-steel construction—a baggage car, four coaches and a diner-

lounge car, in that order. The locomotive and all cars were equipped with tightlock couplers. The train had left Corsicana at 6:13 p.m., 3 min. late, and was moving at a speed of 65 m.p.h. (its limit being 90 m.p.h.) when the six cars were derailed and "considerably damaged."

The derailment occurred on a tangent stretch of track where the grade is 0.69 per cent ascending; it was 6:18 p.m. and the weather was clear. A separation between the second and third cars, the report said, "occurred when the coupler and the draft gear attachments at the rear end of the second car were torn from their fastenings as a result of failure of a draft-sill lug."

The rail was broken into "many pieces," the first of six distinct breaks *(Continued on page 112)*

January Accident Statistics

The Interstate Commerce Commission has made public its Bureau of Transport Economics and Statistics' preliminary summary of steam railway accidents for January, as compared with the corresponding 1947 month. The compilation, which is subject to revision, follows:

Item	Mon. of Jan. 1948	1947
Number of train accidents*	1,212	1,545
Number of casualties in train, train-service and nontrain accidents:		
Trespassers:		
Killed	80	73
Injured	54	66
Passengers on trains:		
(a) In train accidents*		
Killed	14	10
Injured	275	103
(b) In train-service accidents*		
Killed	4	—
Injured	181	205
Travelers not on trains:		
Killed	1	1
Injured	114	88
Employees on duty:		
Killed	64	55
Injured	3,104	3,253
All other nontrespassers:**		
Killed	170	190
Injured	744	727
Total—All classes of persons:		
Killed	333	329
Injured	4,472	4,442

* Train accidents (mostly collisions and derailments) are distinguished from train-service accidents by the fact that the former caused damage of more than $150 to railway property in 1947. Beginning January 1, 1948, this minimum was raised to more than $250.

**Casualties to "Other Nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and non-trespassers,* were as follows:

Persons:		
Killed	161	179
Injured	473	472

S. P. Gets Commuter Fare Hike

Effective on March 15, the Southern Pacific will increase its commutation fares between San Francisco and suburban stations approximately 12½ per cent, the authority for which has been granted by the California Public Utilities Commission. The increases, the road states, are based on a formula "which calls for a decreasing rate per mile as the length of the commutation distance increases." This formula has "ironed out" a number of uneven fare structures, according to the road.

In addition, the S. P. will inaugurate a five-day, 10-ride commuter book, which is good for one round-trip on each day traveled Monday through Saturday. This book is offered for the benefit of those commuters who work on Saturdays, but who are off work on another day of the week.

New Haven Asks I. C. C. to Order Higher N. Y. Commutation

The New York, New Haven & Hartford has asked the Interstate Commerce Commission for authority to apply within the state of New York the same increases in commutation fares which are now in effect on intrastate travel within Connecticut, Rhode Island and Massachusetts. The New Haven's request is the result of a January 27 order by the Public Service Commission of New York which further deferred operation of the tariffs from February 12 to August 12.

Last September, the federal regulatory agency authorized the New Haven to increase the charge for 60-trip unrestricted commutation tickets by 25 per cent, maximum $6, and its 46-trip restricted commutation tickets by 15 per cent, maximum $4.50. The increases were subsequently approved for intrastate travel by the regulatory bodies of Connecticut, Rhode Island and Massachusetts. The petitioner estimated that extension of the increases to New York intrastate commutation fares would produce additional revenue of $470,000 a year.

I. C. C. Gets Briefs In 2 Per Diem Cases

The Interstate Commerce Commission last week received briefs in two per diem complaints pending before it. As noted in *Railway Age* of January 17, page 54, and previous issues, one complaint, filed by the short lines, assails the per diem rates which have been in effect since February 1, 1945, and asks the commission to cut the rate to 95 cents or to other such basis as it may determine, and to award reparations. The other complaint was filed by six western roads—the Atchison, Topeka & Santa Fe; Illinois Central; Chicago, Burlington & Quincy; Northern Pacific; Great Northern and Denver & Rio Grande Western—which allege that the former $1.25 rate, since raised to $1.50, is too low and therefore a factor contributing to the post-war freight car shortage. The complaints are docketed at Nos. 29587 and 29751, respectively.

Among those filing briefs, the Association of American Railroads contends that the commission should find that the per diem rates of $1.15, in effect from February 1, 1945, to May 31, 1947, and the rate of $1.25, in effect from June 1, 1947, to August 31, 1947, were not in excess of reasonable compensation for the costs of car ownership. The commission, it said, should further find that the current rate of $1.50, which became effective last September 1, is reasonable, and pursuant to such findings, dismiss both complaints. Determination of the amount to be charged and paid for the use of a foreign line car, it went on, is primarily and peculiarly a function of railroad management. The commission, it said, should intervene only "under compelling circumstances" not presented by the pending cases.

The complainant short lines, together with the Boston & Maine, and New York, New Haven & Hartford, among other roads, told the commission that, pending the compilation of more exact figures, the evidence of record conclusively shows that a reasonable per diem rate, which they said should be based on 1946 costs, will not exceed 97 cents a day. "Undoubtedly," they stated, "this rate appears to be extremely low compared to the other computations . . . This is explained almost entirely by the lack of the realization of the tremendous overstatement in most studies of the cost of ownership and particularly the overstatement with respect to the cost of car repairs which are actually borne by the freight car owner. It is submitted . . . that it did not cost more than 96.7 cents a day on the average to own a freight car in 1946."

The six western complainants, which also are defendants in the short lines proceeding, asserted that the 105 per cent increase in freight car prices between 1925 and 1947, as well as the corresponding increase in car ownership costs that has occurred in the same interval, "amply justify" a $2 per diem during normal periods. At the same time, they told the commission that the $4.06 average earning value of a freight car during 1946 "amply justifies" a $2.50 per diem during car shortage periods.

Discussing risks of freight car ownership, they said in part that the most critical problem arises from the "improvident" terminating roads' appropriation of originating roads' box cars. They also charged that W. C. Kendall, chairman of the A.A.R.'s Car Service Division, failed to fulfill his promise to maintain box cars on the Burlington, G. N. and N. P. at 90 per cent of their ownership, adding that the C.S.D. stripped the Burlington of 6,600 box cars and then forced that road, under threat of commission prosecution, to further deplete its box car supply by making deliveries to the G.N. and N.P. The western complainants also described as a "statistical misnomer" A.A.R. reports of reduced turn-around time. "It signifies railroad freight volume, not railroad efficiency," they said, adding that "shippers had slowest transit time when Kendall had fastest 'turn-around time'!"

Dismissal of both complaints also

was advocated in another brief filed by the Southern Pacific and Texas & New Orleans. These roads held that the existing per diem of $1.50 represents "liberal rental compensation" and should not be increased. They specifically contended that the western complainants' request for a 50 cents additional charge in times of car shortage should be dismissed.

The Chesapeake & Ohio, meanwhile, told the commission that the establishment of a per diem rate of $2 per day will go a "long way" toward solving periodical freight car shortages and will not be harmful to the railroads that contribute their "fair share" of the cars necessary to handle the nation's traffic. Asserting that the cost of owning and maintaining a freight car is $2 per day, the C. & O. said it has been the advocate of such a charge since the beginning of the freight car shortage. "In the absence of a reasonable per diem," it continued, "there is no incentive for the purchase of new cars by the railroads."

In another brief filed with the commission, the Union Pacific said that the regulatory agency should find that the present per diem of $1.50 reasonably compensates car owners for average car ownership and maintenance costs and is not unreasonable or otherwise unlawful. The U.P. said that a study conducted by it for the year 1946 established that the $1.50 per diem is not higher than a maximum reasonable charge or lower than average car ownership costs.

O. D. T. Gets $10,000 More For Current Fiscal Year

A recently-enacted deficiency appropriation bill, which was signed by President Truman recently, provided an additional $10,000 for Office of Defense Transportation operations during the remainder of the current fiscal year ending next June 30. This is a compromise figure embodied in the conference report reconciling differing House and Senate versions of the bill in which the house had allowed nothing while the Senate had allowed $31,000, the amount recommended by President Truman.

O.D.T. needed the additional funds because amounts previously appropriated for the current year had contemplated that it would be out of business on February 29; but Congress last December extended the Presidential authority under which it operates until March 1, 1949. In addition to the $10,000, O.D.T. also has available something over $76,000 in balances, mostly funds which had been reserved for terminal-leave payments to employees in anticipation of a February 29 windup.

The House appropriations committee explained its refusal to recommend an appropriation in that part of its report on the bill which said that the record of its subcommittee's hearings on the proposed appropriation indicated that O.D.T. "has been able to meet its responsibilities to date with its present number of personnel." On the other hand, the Senate appropriations committee approved the $31,000 sought by the President on the basis of findings that "the postwar transportation problem is still very complex," and that O. D.T. "has been utilizing its personnel strength to the best advantage." This committee added that the amount it recommended would permit O.D.T. "to deal more vigorously with the problems facing it during the balance of this fiscal year."

Elect Officers, Directors of Chicago RR Fair Corporation

An executive committee and a 14-man board of directors were elected at Chicago recently by the non-profit corporation set up to run the Chicago Railroad Fair scheduled to open about July 20 (see *Railway Age* of February 14, page 70, and March 6, page 66). President of the corporation is Major Lenox R. Lohr, head of the Museum of Science and Industry at Chicago, who will actively direct the staging of the show. Other officers elected are: vice-president, R. L. Williams, president of the Chicago & North Western; treasurer, Wayne A. Johnston, president of the Illinois Central; and secretary, G. Murray Campbell, vice-president of the Baltimore & Ohio.

The corporation's board will consist of the aforementioned officers and the following railroad presidents: Ralph Budd, Burlington Lines; C. H. Buford, Chicago, Milwaukee, St. Paul & Pacific; John D. Farrington, Chicago, Rock Island & Pacific; Fred G. Gurley, Atchison, Topeka & Santa Fe; George F. Ashby, Union Pacific; R. J. Bowman, Chesapeake & Ohio; and E. S. French, Boston & Maine. Also elected directors are Paul E. Feucht, vice-president of the Pennsylvania, J. L. McKee, vice-president—assistant to president of the New York Central, and D. J. McGanney, general traffic manager of the Southern Pacific.

It is understood that almost all of the $1¼ million required for the capital cost of the fair—which is to be borne entirely by the railroads—has been subscribed. Every Class I railroad in the country was invited to participate, and a large number have formally indicated their willingness to do so. Some of the participants do not enter Chicago, but it is the aim of the directing heads of the fair to make it a national observance. According to one spokesman, the participating roads will "represent a fair cross-section of all the roads in the country."

In addition to participating in the capital cost of the fair, many individual roads are expected to provide separate exhibits on the grounds. A large portion of the exhibit space also has been set aside for the railroad supply industry, as described in *Railway Age* of March 6, page 66.

Barber and Keeler Address A. U. Rail Transport Institute

Colonel A. B. Barber, Manager of the Transportation and Communication Department of the Chamber of Commerce of the United States, and John B. Keeler, manager, Traffic and Transportation Department of Koppers Company, Inc., were guest speakers at a March 4 supper meeting of the Third Annual Rail Transportation Institute being conducted this month at the American University, Washington, D. C. Presiding at the meeting was Dr. L. M. Homberger, professor of transportation at the university and director of the institute.

Colonel Barber who spoke on "Transportation in a Dynamic Economy," defended the "American system of competitive rate making" as one which well meets the needs of industry in this country. The rigidity which he found in rate structures of other countries, where the adjustment was "dictated from the top down," was contrasted by Colonel Barber with the American plan of letting the structure be built "from the bottom up" as the "outgrowth of natural forces working in a regime of independent and competing privately-owned carriers, each having as its interest to serve the shippers on its lines and to give them the lowest rates consistent with a reasonable overall rate structure."

Colonel Barber also stated again his position in favor of enactment by Congress of the pending Reed-Bulwinkle bill to stay the operation of anti-trust laws with respect to carrier rate-making procedures and other joint actions approved by the Interstate Commerce Commission. Enactment of such legislation, he said, "will clarify the apparent overlap of jurisdiction between the Interstate Commerce Commission acting under the Interstate Commerce Act and the Department of Justice acting under the anti-trust laws."

Mr. Keeler, who spoke on "Carrier Interest in Shipper Requirements," first paid tribute to the railroads for their "marvelous" performance of the war period. While he was mindful of the difficulties under which the railroads are still working, he nevertheless suggested that they should strive to improve the car supply in the interest of more adequate service. He also called for the development of more dependable freight schedules; and for reduction of rough handling in transit in the interest of cutting damage claims.

Mr. Keeler emphasized that he was setting up objectives toward which the carriers should strive, and thus his remarks were not intended to be critical of their performance under present conditions. He said further that the decentralization of industry tends, more

than any other development, to reduce railroad traffic; and that a constantly increasing level of freight rates is an important factor in bringing about such decentralization.

In addition to the speakers, guests at the meeting included Interstate Commerce Commissioners Clyde B. Aitchison and Walter M. W. Splawn, E. H. Bunnell, vice-president of the Association of American Railroads, Warren C. Kendall, chairman of the Car Service Division and E. F. Lacy, executive secretary of the National Industrial Traffic League. Some of these participated in a discussion which followed the addresses.

Air Parcel-Post Service Proposed by Langer

Senator Langer, Republican of North Dakota, has introduced S.2281 to provide for an air parcel-post service. The bill would establish eight rate zones for air-parcel-post matter which would consist of "mailable matter exceeding eight ounces in weight, but not weighing more than 70 lb. nor measuring more than 100 in. in length and girth combined."

The rates would range from 55 cents for the first pound or fraction thereof and 4 cents for each additional pound or fraction thereof, delivered within the first or second zones, to 80 cents and 65 cents, respectively, for delivery within the eighth zone. The postmaster general would be authorized to add a surcharge on matter "of light weight in relation to size.' '

Hearings on Transport Department Bill to be Resumed on March 23

Representatives of various transportation industries, including the railroads, will testify March 23 when hearings on S.1812, calling for the establishment of a federal Department of Transportation under a secretary of transportation, will be resumed before a subcommittee of the Senate committee on interstate and foreign commerce. J. Carter Fort, vice-president and general counsel of the Association of American Railroads, is expected to appear on behalf of the railroads.

As reported in *Railway Age* of March 13, page 89, hearings on the measure, sponsored by Senator Capehart, Republican of Indiana, were launched March 9, at which time Colonel J. Monroe Johnson, director of the Office of Defense Transportation, urged its enactment. Under Secretary of Commerce W. C. Foster, who also testified the same day, contended, however, that approval of such legislation at the present time would be "premature."

Meanwhile, further opposition to the measure, which was outlined in *Railway Age* of December 6, 1947, page 74, was presented to the Senate group on March 10 by Oswald Ryan, acting chairman of the Civil Aeronautics Board, and Vice Admiral W. W. Smith, chairman of the United States Maritime Commission. The Interstate Commerce Commission, which also is expected to oppose the bill, has not as yet appeared before the subcommittee.

According to Mr. Ryan, passage of the bill would defeat the attainment of the objectives of the national transportation policy as declared by Congress. He contended that it provides neither for a unification of regulation with respect to transportation nor for the preservation of the present independent responsibilities of the I.C.C., M.C. and C.A.B.

"It purports to preserve the independence of each regulatory body while at the same time it seriously impairs or destroys that independence by placing those quasi-judicial, quasi-legislative agencies under the control of an executive official," he said. "It recognizes the necessity for divergency of treatment, but at the same time it makes the untenable assumption that there is sufficient similarity among the different modes of transportation to justify bringing all under the control of a cabinet officer with respect to the most fundamental matters—the broad policy framework within which transportation services are to be rendered."

Declaring that the bill would be prejudicial to transportation in general and highly detrimental to air transportation in particular, Mr. Ryan said that the regulation of transportation must remain a judicial function "divorced from control" by the executive branch of the government. Another reason why government transportation agencies should be free from executive control, he went on, is that an executive head of a department which is involved in decision affecting important and conflicting private interests as well as vital public interests is certain to be exposed to political pressures and influence. "When one considers the vast financial interests which are involved in the regulation of our surface and air transportation," he said, "it is difficult to imagine an executive officer who would not be the target of powerful political and financial forces that would be concerned in the decisions of his department."

Mr. Ryan also told the subcommittee that the government will not be able to attract "top-flight" men to the C.A.B., I.C.C. and M.C. if "you reduce the independence and prestige" of those agencies. "The independence of the administrative tribunal and its freedom from political control are the twin principles upon which our present system of public service regulation rests," he continued.

According to the C.A.B. spokesman, coordination in regulatory policy with respect to the transportation industry cannot be adequately achieved through a supervision of a cabinet officer. Asserting that Congress is the "appropriate body" to provide for the coordition of such policy, he said that "Congress should not surrender its power to the executive branch of the government." At the same time, he declared that the full development of all transportation services will not be achieved if the expansion of one class of carrier is checked in order to preserve a market for another class. He also said the C.A.B. is fearful of the effect of the coordination power upon competition between the different modes of transportation involved and that it is concerned with the effect which the proposed legislation could have on the rate policies of the different transportation agencies.

Admiral Smith, meanwhile, described the proposed legislation as "inimical to the interests of the merchant marine and ocean shipping industry" of the United States and "fundamentally unsound and in direct conflict" with the provisions and purposes of the Merchant Marine Act of 1936. The bill, he said, makes no reference to the national maritime policy, but, instead, gives all emphasis to the aspects of rail transportation.

"It is true," he stated, "that the bill would permit the Maritime Commission to perform its so-called rule-making functions independently of the secretary of transportation, but to separate these from the administrative functions of the commission would only result in a diffusion of responsibility which would be distinctly disadvantageous to the merchant marine and the shipping industry."

The bill, according to Admiral Smith, is not clear as to how the regulatory and administrative functions of the M.C. would be separated under a Department of Transportation. "Where," he asked, "would the line of division be drawn . . . between the commission's functions with respect to construction and charter of vessels, financial aid without subsidy grants, administration of various reserve funds, ship mortgage and insurance funds and hull insurance?"

Admiral Smith asserted that the ocean shipping industry differs greatly from the other forms of transportation which S.1812 seeks to consolidate under one department. "Rail, bus and truck lines are carriers entirely within domestic control, as are the domestic air lines," he observed in part. "On the other hand, the ocean shipping industry is, on each voyage, a transaction in which some other nation has an interest which it might endeavor to protect should the United States undertake to exercise complete control. Shipping must compete not only with domestic carriers."

North Western Centennial Train

The Chicago & North Western introduced to the press, on March 15, its completely reconditioned, 112-yr.-old "Pioneer" locomotive and recently completed replicas of its tender and the first coach to run in the city of Chicago. R. L. Williams, president of the road—which is celebrating its 100th anniversary this year—described in an inter-

view the completed plans for a centennial train to visit approximately 50 communities on the line from May 1 to about July 1.

Center of attraction on the train will be the 10-ton "Pioneer," a second-hand Baldwin locomotive which pulled the first train out of Chicago on October 25, 1848. With it will travel the replicas of its original tender and of the first passenger coach to move on the North Western—the latter having been completed and ready for service on July 14, 1848. (Until that day the road utilized flat cars only). In completing the replica, the North Western shop staff was forced to utilize every source of information, because many records of the original Galena & Chicago Union were destroyed in the Chicago fire. Employees showed great interest in the job and many of them contributed their ideas and assistance. The link and pin couplers were manufactured in the local blacksmith shops.

The locomotive and the replicas will be moved on flat cars, together with motor-driven, rubber-tired replicas of engine, tender and coach, and of a '400" Diesel locomotive and modern coach, which can be unloaded and used in parades and other celebrations.

Also featured in the train will be a museum car which will contain historical exhibits, photographs, old timetables, dining car menus, posters and waybills collected by the company during a contest open to local historical soieities and employees of the system.

Following its tour of the road, the exhibit will proceed to the Chicago Railroad Fair.

Senate Passes I.C.C. and Roads Appropriation Bill

The Senate on March 15 passed its version of the Independent Offices Appropriation Bill for the fiscal year ending June 30, 1949, which carries $10,969,317 for the Interstate Commerce Commission and $435,588,854 for the Public Roads Administration. These amounts, recommended by the Senate committee on appropriations, are, respectively, $150,000 more and $24,000,000 less than the appropriations approved by the House, so the bill was sent to a Senate-House conference committee for reconciliation of those and other differences between the two versions.

The Senate committe's report stated that the additional $150,000 proposed for the I.C.C. would permit the commission "to broaden its highway safety program and provide for necessary personnel to handle an increased work load." The $10,969,317 total approved by the Senate would be $226,317 more than the commission has had during the current fiscal year, but $259,683 less than the fiscal 1949 appropriation recommended for it in President Truman's budget.

The $24,000,000 reduction made by the Senate in the proposed appropriation for the Public Roads Administration is the result of a $25,000,000 cut in the amount approved by the House for the so-called federal-aid post-war highway system and the provision of $2,000,000 (instead of $1,000,000, as proposed in the House version) for a testing and research laboratory. For the federal-aid post-war highway system, the House had accepted President Truman's budget estimate of $452,288,854, and the Senate cut reduces that amount to $427,288,854. The proposed P.R.A. appropriation also includes $7,300,000 for grade crossing elimination and protection work, that item being the same in both versions of the bill. It will take up in part the prewar authorizations for that work. Under the post-war program, grade-crossing is authorized under that provision of the applicable legislation which permits the use for such work of up to 10 per cent of the funds made available for highways.

Would Give More Money To Federal Barge Lines

Senator Overton, Democrat of Louisiana, has introduced S.2296 to increase from $15,000,000 to $30,000,000 the amount of capital stock authorized to be issued by the government-owned Inland Waterways Corporation, operator of the Federal Barge Lines. The bill would also authorize an appropriation of $18,000,000 to be used by the Secretary of the Treasury for purchase of the additional stock "upon call from time to time by the secretary of commerce."

As noted in the *Railway Age* of January 17, page 53, President Truman's budget for the fiscal year 1949 proposed that the government, which has already sunk $12,000,000 in I.W.C., provide another $3,000,000, thus taking up the remainder of the presently authorized stock. Meanwhile, the House committee on interstate and foreign commerce recently held hearings on bills providing for the sale of I.W.C. facilities to private interests (see *Railway Age* of March 6, page 59).

Money for Retirement and Mediation Boards

Appropriations recommended in President Truman's budget for Railroad Retirement Board and National Mediation Board activities during the fiscal year ending June 30, 1949, were embodied without change in the so-called labor-federal security appropriation bill which has passed by the House on March 8. Acceptance of the budget figures had been recommended by the House committee on appropriations in its report on the bill.

Thus the measure went to the Senate carrying $642,416,000 for the Retirement Board and $862,550 for the Mediation Board and National Railroad Adjustment Board. The former figure includes $637,986,000 to be appropriated to the Railroad Retirement Account in the Treasury, and $4,430,000 for the board's administrative expenses under the Railroad Retirement Act. The latter compares with the current fiscal year's $5,721,000 cost of administration. The bill carries no appropriation for administration of the Railroad Unemployment Insurance Act since that act provides that 10 per cent of the taxes collected under it shall be available for administrative purposes.

The bill's provisions relating to the R.R.B. appropriation would end as of the date of its enactment the "national emergency" in so far as it permits continuance of the retirement system's arrangements for military service credits. These arrangements have provided for appropriations from the general fund of the Treasury to the Retirement Account for the purpose of maintaining the status, as to benefits, of railroad employes in military service after September 7, 1939. The House appropriations committee noted that the proposed fiscal 1949 appropriation of $637,980,000 to the Retirement Account includes $24,340,639 for the military service credits.

"The Committee," its report continued, "can see no valid reason for an individual voluntarily leaving railroad employment today—more than two years after the end of actual fighting —being entitled to benefits under this particular part of the Railroad Retirement Act. The (Railroad Retirement) Board concurs fully in this view and in fact has recently recommended to a legislative committee of the Congress that the national emergencies be terminated insofar as they affect the military service credit provisions of the Railroad Retirement Act. This committee has decided to hasten action in the matter, and has accordingly included a provision in the accompanying bill to accomplish that purpose."

The $862,550 provided for the Mediation and Adjustment boards compares with appropriations totaling $869,400 for the current fiscal year. The fiscal 1949 proposal includes $332,100 and $374,200, respectively, for N.M.B. and Adjustment Board "salaries and expenses." The remainder is divided $100,000 for arbitration and emergency boards and $56,250 for printing and binding and costs of handling penalty mail.

Santa Fe's "Texas Chief" To Begin Service April 3

The "Texas Chief," a new Diesel-powered streamliner of the Atchison, Topeka & Santa Fe, will inaugurate daily service between Chicago and Galveston, Tex., on April 3. The train will depart from Chicago at 6 p.m. and arrive in Galveston at 8:15 p.m. the following day, with a running time of 26½ hr. Eastbound, the new equipment will

depart from Galveston at 6:45 a.m. and arrive in Chicago at 9 a.m. the next day. The train will have a running time of 25 hrs. both ways between Chicafio and Houston, Tex.

In addition to Pullman accommodations, the "Texas Chief" will carry chair cars equipped with the latest innovations, including leg rests which are put in a fixed position beneath the seat when not in use. Bedrooms, roomettes and sections will be available for passengers whose destination is Wichita, Kans., and the train will carry roomettes, bedrooms, duplex roomettes and sections for passengers between Chicago and Houston and Galveston. Drawing rooms, bedrooms and compartments will be available between Chicago and Oklahoma City, Okla., and sections, bedrooms and compartments from Chicago to Tulsa.

The new streamliner will be equipped with Broadcasting equipment which will make available a radio channel for popular and semi-classical music and a public address system in the lounge, dining car and through Pullman cars. Each room on the train will be equipped with a push-button selector, a loud speaker and volume control. An automatic pilot lamp in each room will notify the occupant of a coming train announcement.

The train will carry a lunch-counter dining car where full-course meals or sandwiches and coffee can be obtained. A registered courier nurse will be available.

Would Sell Barge Lines

Prompt enactment of legislation for disposal of the Federal Barge Lines of the government-owned Inland Waterways Corporation has been urged by the Chamber of Commerce of the United States in a communication sent to the House committee on interstate and foreign commerce.

The chamber said the barge lines have long since completed the demonstration for which they were originally created in 1924, that they are a source of unfair competition to private business and a burden on the taxpayers because of failing to meet expenses, and that private operators are willing and able to carry on the service.

While endorsing both bills (H.R.-5318 and H.R.5476), pending before the committee to attain early disposal of the barge lines, the chamber said it considered the latter decidedly preferable, adding: "In permitting sale of portions of equipment, terminal facilities or operating rights, H.R.-5476 will remove a most serious obstacle imposed by the requirement of existing law to the effect that the entire operations on the Mississippi and its tributaries must be disposed of as a unit. It is also preferable, in requiring that the disposal be by sale, thus excluding lease or other arrangements which would be permitted by H.R.5318. While the question of further expenditures of public moneys for rehabilitation of the barge lines is not dealt with in the bills under consideration, the chamber believes no funds should be appropriated or applied for expansion, modernization or recapitalization of the Inland Waterways Corporation."

Freight Car Loadings

Loading of revenue freight for the week ended March 6 totaled 792,571 cars, and the summary for that week as compiled by the Car Service Division, A.A.R., follows.

Revenue Freight Car Loading

For the Week Ended Saturday, March 6 District	1948	1947	1946
Eastern	154,474	149,424	147,946
Allegheny	170,661	168,511	166,119
Pocahontas	69,514	66,429	64,285
Southern	136,718	134,994	140,857
Northwestern ...	78,365	93,566	87,620
Cen. Western ..	118,937	127,885	117,674
Southwestern ..	63,902	64,966	61,688
Tot. W. Dist...	261,204	286,417	266,982
Total All Roads	792,571	805,775	786,189
Commodities:			
Grain & grain products	33,200	51,340	47,160
Livestock	10,043	13,190	15,219
Coal	189,778	180,463	187,699
Coke	14,473	14,362	13,039
Forest products .	42,883	47,115	42,035
Ore	15,293	13,011	9,819
Mdse. l.c.l.	115,404	121,553	121,756
Miscellaneous ..	371,497	364,741	349,462
March 6	792,571	805,775	786,189
February 28	791,089	849,991	782,397
February 21	805,376	776,689	723,281
February 14	734,262	799,977	707,054
February 7	747,394	767,301	713,240
Cumulative total, 10 weeks...	7,694,493	8,003,153	7,319,325

In Canada.—Carloadings for the week ended March 6 totalled 74,516 cars as compared with 76,422 cars for the previous week and 65,561 cars for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
March 6, 1948	74,516	37,860
March 8, 1947	65,561	35,582
Cumulative totals for Canada:		
March 6, 1948	709,172	349,558
March 8, 1947	669,552	359,351

13 Electric Railroads Seek Mail-Pay Increase

Thirteen electric railroads have asked the Interstate Commerce Commission for authority to increase their mail-pay rates by not less than 45 per cent of the rates now in effect. The petitioners, whose mail pay rates have remained unchanged since 1925, were not affected by the commission's order of December 4, 1947, in the Docket No. 9200 proceeding, wherein it approved a temporary increase of 25 per cent in mail pay for steam railroads generally. As reported in *Railway Age* of December 27, page 59, the latter increase became effective February 1 and was retroactive back to February 19, 1947.

The 13 petitioners include the Bamberger; Cedar Rapids & Iowa City; Charles City Western; Chicago, Aurora & Elgin; Chicago South Shore & South Bend; Des Moines & Central Iowa; Lackawanna & Wyoming Valley; Mason City & Clear Lake; Northeast Oklahoma; Potomac Edison; Sand Springs; Washington & Old Dominion; and the Waterloo, Cedar Falls & Northern.

Shows State-to-State Flow of 1947 2nd-Quarter Traffic

The Bureau of Transport Economics and Statistics of the Interstate Commerce Commission has issued six tables showing, on a one-per-cent-sample basis, the state-to-state movements of tons of freight as represented by the carload terminations reported by Class I railroads for the second quarter of 1947. The compilation is Statement No. 486 of the bureau.

As in the previously-issued compilation covering last year's first quarter, the data are some of those being taken from waybills submitted in response to the commission's September 6, 1946, order requiring Class I roads to file all audited waybills representing their carload terminations which are numbered "1" or with digits ending in "01."

CONSTRUCTION

Atlantic Coast Line.—This road has authorized the construction of track facilities at Pierce, Fla., at a probable cost of $121,466.

Chicago, Milwaukee, St. Paul & Pacific.—This road, as part of its 1948 improvement program, will build additional yard tracks at Milwaukee, Wis., and construct a shop at that point for the servicing and repairing of Diesel locomotives. Other projects include the construction of a grade separation at Minneapolis, Minn., the enlargement and modernization of the road's passenger station in Sioux City, Iowa, and the construction of an additional freight house in Chicago.

Kentucky & Indiana Terminal.—This road is altering its roundhouse at Louisville, Ky., to provide facilities for the handling of Diesel-electric switchers. The present locomotive pits will be removed, and two pits for serving Diesels, plus a 30-ton crane, will be installed. The crane has been contracted for by Manning, Maxwell & Moore, and the erection of steel framework in connection with the installation of the new facilities will be built by the George L. Mesker Steel Corporation. The building is being altered by the Henry Bickel Company.

Louisville & Nashville.—This road has authorized the expenditure of approximately $71,000 for additional tracks and coal-handling facilities at Jackson, Ky. Also, about $78,000 will be spent for additional mine tracks on the 5-mi. Homestead branch in the southern part of Hopkins county, Ky.

Northern Pacific.—This road will remodel its yard office and passenger depot in Livingston, Mont., at an estimated cost of $127,000. The contract for remodeling has been awarded to the Haggerty-Messmer Company of Bozeman, Mont., and the plumbing and heating work has been contracted for by Cissel & Anderson, of Livingston. In addition, the N. P. will relocate and replace its depot at West Fargo, N. Dak., at a cost of approximately $32,500. The project includes the construction of a 22-ft. by 64½-ft. brick depot, together with sidewalk, platforms, driveways and other facilities. Contract for the building work has been awarded to the Meinecke-Johnson Company.

Pacific Electric.—This road has begun work on a new substation at Sierra Park on its Pasadena (Cal.) short line, which will cost approximately $70,000. The reinforced concrete building is being constructed by J. O. Oltmans, Los Angeles, Cal. Construction is also underway on a motor coach terminal at Whittier, Cal., at a cost of $60,000. The station building is being erected by the Secrest Construction Company of Whittier.

Reading.—This road has awarded a contract to the Hauser Construction Company, Philadelphia, Pa., for the reconstruction of cold-storage rooms in the Reading Terminal market, Philadelphia, at an estimated cost of $120,000.

Southeastern. — This road's application before the Interstate Commerce Commission for authority to construct a new line between Atlanta, Ga., and Savannah, approximately 229 miles, has been assigned for hearing on April 20 at the Atlanta Biltmore Hotel, Atlanta. Examiner Pritchard will preside. Hearing on the application originally had been scheduled for January 6, but was cancelled. Details of the proposed line were outlined in *Railway Age* of September 13, 1947, page 94, and previous issues.

EQUIPMENT AND SUPPLIES

Domestic Equipment Orders Reported in February

Domestic orders for 17 Diesel-electric locomotives, 7,000 freight cars and 56 passenger cars were reported in *Railway Age* in February. The approximate cost of the locomotives is $3,700,000, the estimated cost of the freight cars is $27,300,000 and the passenger cars will cost an estimated $8,400,000. The accompanying table lists the orders in detail. During the first two months of 1948 the *Railway Age* has reported domestic orders for 101 Diesel-electric locomotives costing an estimated $24,300,000, a total of 9,250 freight cars the estimated cost of which is $36,055,000, and the 56 passenger cars previously mentioned.

LOCOMOTIVES

Date	Purchaser	No.	Type	Builder
Feb. 7	Erie	2	6,000-hp. D.-E. frt.	Electro-Motive
		2	6,000-hp. D.-E. frt.	American
		4	D.-E. switch.	Baldwin
		4	D.-E. switch.	American
		5	D.-E. switch.	Electro-Motive

FREIGHT CARS

Feb. 7	I. C.	1,000	50-ton Hopper	General American
Feb. 7	N.Y.C.	1,000	55-ton Box	Despatch Shops
		1,000	55-ton Hopper	Despatch Shops
		500	70-ton Gondola	Despatch Shops
Feb. 7	P. & L.E.	1,000	55-ton Box	Despatch Shops
		1,000	55-ton Hopper	Despatch Shops
		500	70-ton Gondola	Despatch Shops
Feb. 28	C.R.I. & P.	1,000	P-S-1 Box	Pullman-Standard

PASSENGER CARS

Feb. 21	A. T. & S. F.	27	Sleeping	Budd
		29	Sleeping	Amer. Car & Fdry

FREIGHT CARS

The **Chicago, Burlington & Quincy** has ordered 3,050 freight cars from its own shops. Included in the 1948 equipment program are 1,000 50-ton box cars, 100 50-ton parts cars, 150 70-ton covered hopper cars, 500 70-ton steel hopper cars, 250 70-ton steel ballast cars, 500 40-ton stock cars, 300 50-ton flat cars, 50 70-ton mill-type gondola cars and 200 16,000-gal. tank cars. It is expected the box cars will be completed in July and that the other cars will be finished at various times during the remainder of the year.

The **Louisville & Nashville** will spend approximately $55,000 in the near future to convert 30 box cars into cabooses. Work will be done at the South Louisville, Ky., shops.

The **St. Louis Refrigerator Car Company** has ordered 100 40-ton refrigerator cars from its own shops.

The **Wabash** reported it contemplates building 200 55-ton hopper cars in its Decatur, Ill., shops during the latter part of this year.

The **Mather Stock Car Company** has ordered 150 40-ft. 40-ton refrigerator cars from its own shops.

The **Carbon County** has ordered 300 70-ton hopper cars from the Pullman-Standard Car Manufacturing Company. The inquiry for this equipment was reported in the *Railway Age* of December 6, 1947.

The **Illinois Terminal** has ordered 200 50-ton box cars from the American Car & Foundry Co.

The **Missouri Pacific** has ordered 55 steel cabooses from its Sedalia, Mo., shops.

The **Northern Pacific** plans to build 500 40½-ft. 50-ton box cars and 200 52-ft. 50-ton flat cars in its Brainerd, Minn., shops. Construction of the box cars probably will begin in June and the flat cars probably will be started in the latter part of September.

The **St. Louis & O'Fallon** has ordered 30 50-ton hopper cars from the shops of the St. Louis Refrigerator Car Company.

The **Delaware & Hudson** has ordered 150 40-ft. 40-ton steel box cars and 150 50-ton steel hopper cars from its Oneonta, N. Y., shops. Completion of all the cars is expected during the early part of 1949.

MARINE

The **Brooklyn Eastern District Terminal** has ordered 4 welded steel car floats, each with a capacity of 17 cars, from the Bethlehem Steel Company.

SIGNALING

The **Electro-Motive Division of the General Motors Corporation** has ordered 10 sets of intermittent inductive train control equipment from the General Railway Signal Company. Four sets will be installed on Diesel-electric passenger locomotives for the Pere Marquette, and 6 sets will be installed on Diesel-electric freight locomotives for the Atlantic Coast Line.

The **Wabash** has placed an order with the Union Switch & Signal Co. for the necessary materials to install an all-relay interlocking at Bement, Ill., involving a Style-B-30 control machine, H-5 searchlight signals, M-22A dual-control electric switch movements, relays and housings. The field installation will be done by railroad forces.

SUPPLY TRADE

Charles J. Reimer, formerly procurement metallurgist for **SKF Industries, Inc.,** has been appointed general purchasing agent, to succeed **J. F. Whelihan, resigned.**

Frederick K. Vial, whose retirement as vice-president and director of the **Grif-**

fin Wheel Company at Chicago, was reported in *Railway Age* of February 14, was born in Lyonsville, Ill., on April 22, 1864. Mr .Vial received his higher education at the University of Illinois, having been awarded degrees in agriculture and natural history in 1886 and a master's degree in civil engineering in 1918. His first railroad service came in 1887, when he was employed as a rodman with the Atchison, Topeka & Santa Fe. He served as division engineer of the Chicago & Alton (now part of the Gulf, Mobile & Ohio) from 1889 to 1892, and was chief engineer of the Ajax Forge Company at Chicago during 1895 and 1896. In the following year, Mr. Vial became principal assistant engineer of the Chicago & Western Indiana, and in 1902 he joined the Griffin Wheel Company as mechanical engineer. In 1906 he was appointed chief engineer, in charge of manufacturing operations. cupola mixtures, wheel design, plant construction and research work. In addition, he was given other responsibilities affecting all plants of the company. Later Mr. Vial was elected vice-president, and in 1917 he was also elected a director. Upon the formation of the Association of Manufacturers of Chilled Car Wheels in 1908, he was appointed consulting engineer, and subsequently became also vice-president, which positions he held at the time of his retirement.

Eugene S. Wright, whose promotion to district sales manager for the **Baldwin Locomotive Works,** at St. Louis, Mo., was announced in *Railway Age* of February 28, joined Baldwin's service department for Diesel-electric locomotives shortly after he graduated from Purdue Uni-



Eugene S. Wright

versity. He later worked in the sales department in the Chicago district office for two years and was then transferred to Eddystone, Pa. From 1943 to 1946 Mr. Wright was a mechanical engineer with the United States Army Transportation Corps and spent two years in India assigned to the Bengal & Assam Railway. He rejoined Baldwin as assistant to the sales manager of Diesel locomotives and engines and in May, 1947 he was promoted to sales manager, with headquarters at Eddystone.

The **Hooper-Green Company** 1039 North Pennsylvania street, Indianapolis, Ind., has been appointed district sales representative in the Indiana territory for the Baker-industrial truck division of the **Baker-Raulang Company.**

Arthur S. Roberts, formerly assistant counsel specializing in labor relations and contractual agreements for **SKF Industries, Inc.,** has been appointed secretary and counsel of the firm.

Kelite Products, Inc. has announced the promotion of **Clarence Coleman** to regional manager of the Arizona-Nevada district, with headquarters in Phoenix, Ariz.

Wayne D. Dukette, formerly manager of the Cincinnati, Ohio, steel service plant of **Joseph T. Ryerson & Son, Inc.,** has been appointed manager of the new plant in Emeryville, Cal.

Fay Brainard, formerly plant engineer of the Portland, Ore., plant of the Hyster Company, has been appointed to the newly created position of special assistant to **Eugene Caldwell,** general manager. **Svante Einrem,** who has been with the company since 1943, has been appointed plant engineer, to succeed Mr. Brainard.

John I. Snyder, Jr., chairman of the board of the **Pressed Steel Car Company,** has been elected president, to succeed **Ernest Murphy,** who has retired. Mr. Snyder, a sketch of whose career appeared in the *Railway Age* of December 13, 1947, will continue as chairman of the board of directors. The election of **William T. Kilborn,** president of the Flannery Bolt Company, as a director and chairman of the executive committee of Pressed Steel, also was announced. Mr. Murphy, who was born in Padiham, England, came to the United States in 1909, in which year he joined the Butler, Pittsburgh, Harmony & New Castle Interrurban Traction Company as division engineer in charge of construction. In 1911 he joined the Interborough Rapid Transit Company and from 1917 to 1940 he was associated with the United Traction Company at Albany, N. Y. During the latter period he also was president of the Capital District Transportation Company in Albany. Mr. Murphy joined Pressed Steel in 1941, at the Hegewisch plant, Chicago, where he was in charge of the armored tank division. He later became vice-president in charge of operations and was elected president in 1945.

George E. Cornwall, manager of sales of the transportation seating division of the **Heywood-Wakefield Company,** has announced the appointment of **Edward F. Maher** as Pacific Coast manager for railway car and bus seating, with headquarters at Los Angeles, Cal. Mr. Maher has been associated with the company for 23 years and for the last ten years has been Pacific Coast manager for the theater seating and school furniture divisions.

Maurice Stanley, president of the **Fafnir Bearing Company** for the last 21 years, has been elected chairman of the board, and **Stanley M. Cooper,** formerly executive vice-president, has been elected president to succeed Mr. Stanley.



Maurice Stanley

Before joining Fafnir as sales manager in 1914, Mr. Stanley was export manager of Russell & Erwin. He is direc-



Stanley M. Cooper

tor of the Stanley Works, the New Britain Machine Company, and the Union Manufacturing Company and vice-president and a director of the Hart & Cooley Co. Mr. Cooper joined Fafnir in 1924 and has worked successively as advertising manager, secretary, vice-president and executive vice-president.

Fred H. Johnson, chief engineer of the **Carnegie-Illinois Steel Corporation's** Chicago district, has been appointed assistant chief engineer of the company, with headquarters at Pittsburgh, Pa.

The **Texas Company** has announced the appointment of **J. M. P. McCraven** as manager of the railway traffic and sales department, with headquarters at New York, to succeed the late **J. L. Lavalle,** whose death was reported in the *Railway Age* of February 21. Mr.



J. M. P. McCraven

McCraven joined the Texas Company at Houston, Texas, in 1916, and worked successively as chief accountant, assistant district manager, district manager and assistant manager at Chicago, the position he held at the time of his recent appointment.

D. Hale Darnold has been appointed assistant sales manager of the sound division of the **Webster Electric Company,** at Racine, Wis. Before joining Webster, Mr. Darnold worked successively for the Kelvinator Corporation, Hotpoint, Inc., and the tuttle and kift division of the Ferro Enamel Corporation.

David C. Affleck, general supervisor, project engineering, of the **Carnegie-Illinois Steel Corporation's** Gary Steel Works, at Gary, Ind., has been appointed assistant chief engineer.

Stuart W. Goodenough, formerly on the staff of the general manager of sales, **American Steel & Wire Co.,** at Cleveland, Ohio, has been appointed Chicago manager of the manufacturers products sales department, succeeding the late **C. J. Quill.**

Norman B. Johnson, assistant executive vice-president of the **Pullman-Standard Car Manuacturing Company,** at Chicago, has been appointed head of all activities relating to the operation of the Pullman Car Works, the Chicago passenger car division of the company.

Frank A. Jones, whose appointment as chief engineer of the **Dearborn Chemical Company,** at Chicago, was reported in *Railway Age* of March 13, was born at St. Louis, Mo., on February 23, 1908. Mr. Jones has, at different times during his career, been associated with the Terminal Railroad Company at St. Louis, the Busch-Selzer Brothers Diesel Engine Company in that city and the Missouri Pacific. He was a draftsman in the mechanical department of the latter road, at St. Louis, at the time of his appointment with Dearborn Chemical.

The **Link-Belt Company,** with headquarters at Chicago, has opened district sales offices at Charlotte, N. C., and Wilmington, Del. Heading the Charlotte office as district sales manager is **Thomas O. Appleton,** formerly district sales engineer at Baltimore, Md. **William H. Kinkead,** who has been associated with the company's plant in Philadelphia, Pa., in various capacities since 1920, has been appointed district sales manager in charge of the Wilmington office.

Carl D. Franks, formerly midwestern regional manager of the **Portland Cement Association,** has been elected vice-president for promotion.

Frank B. Newbert, who has worked in various purchasing capacities for the **American Brake Shoe Company** since 1934, has been appointed assistant general purchasing agent.

The **Yale & Towne Manufacturing Co.,** Philadelphia, Pa., has announced the unification of all sales and service facilities in behalf of its electric truck, handlift truck and dial scale divisions at the Railway Exchange building, 80 E. Jackson boulevard, Chicago 4, under **Arthur H. Dobler,** regional manager. **S. A. March** will continue in advisory and consulting capacities.

The **Buckeye Steel Castings Company** has announced the appointments of the following sales representatives: **George T. Johnson, Jr.** in the southeastern district, with headquarters at Columbus, Ohio; **Eugene B. Schrock** in the western district, with headquarters at Chicago, and **Albert T. Johnson** in the eastern district, with headquarters at New York.

The **Koppers Company** has announced the appointments of **D. D. Hamilton** as manager of the building materials section of the products division, and **Thomas J. Battle,** as assistant to Mr. Hamilton.

The **American Steel & Wire Company,** a subsidiary of the United States Steel Corporation, has announced the appointments of **O. B. Stauffer, Jr.,** former supervisor, advertising production, as assistant manager, advertising; **John E. McGrath,** former sales promotion supervisor, as assistant manager, market development; and **C. C. Plumback,** former supervisor of merchandising, as director, merchandising market development.

Henry H. Ziesing, vice-president in charge of sales of the **Midvale Company,** has been elected a director of the company, to succeed the late **Harry L. Frevert.**

The **Aro Equipment Corporation,** Bryan, Ohio, has announced the following changes and additions to the field sales personnel of its air tool division: **J. W. Littleton,** formerly division manager at Cincinnati, Ohio, has been appointed manager of the Detroit, Mich., territory; **L. O. Barrett** of the Cleveland office, replaces Mr. Little at Cincinnati; **C. Hoffman** of Indianapolis, Ind., has joined the factory sales force as a special sales representative; **E. A. Granzow** has been appointed assistant to E. J. Somerville, division manager in Chicago; **T. Fairchild** has been appointed assistant to G. M. Gille, in the St. Louis, Mo., territory; **B. Broekhuizen** has been appointed representative in the Atlanta, Ga., territory under J. McEwen Cherry, territory manager; **H. J. Connell** has been appointed assistant to A. B. Schuhl, manager of the New York office, and **W. Y. Smith** has been appointed to the Boston, Mass., office, as assistant to T. F. O'Malley, manager in New England.

The **McKay Company** has announced the appointment of the **Johnson Welding Equipment Company** as Chicago district distributors of McKay electrodes, with headquarters at 2640 W. Van Buren street, Chicago 12.

ABANDONMENTS

Missouri & Arkansas—Eaxminer A. G. Nye has recommended in a proposed report that Division 4 of the Interstate Commerce Commission permit abandonment by this road of its entire line from Neohso, Mo., to Wayne, 32.3 miles, and from Seligman, Mo., to Helena, Ark., 298 miles, including branch lines from Junction, Ark., to Eureka Springs, 2 miles, and from Freeman, Ask., to Berryville, 3.1 miles. The abandonment was recommended subject to the condition that the line, or any parts thereof, be sold to any responsible party offering, within 40 days of the proposed abandonment certificate's date, to purchase it for continued operation and willing to pay not less than the net salvage value, estimated by the applicant at $2,032,396.

At the same time, Examiner Nye recommended that the commission authorize the M. & A. to abandon operations under trackage rights agreements over (1) 0.79 mile of the Joplin, Mo., Union Depot; (2) the Kansas City Southern between Joplin and Neosho, approximately 18.5 miles; (3) the St. Louis-San Francisco between Wayne and Seligman, approximately 9 miles; and (4) 0.56 mile of the Illinois Central at Helena.

According to Examiner Nye, the financial history of the road has been a series of receiverships, foreclosures and reorganizations. Organized in 1935, the road ceased operations on September 6, 1946, when, as reported in *Railway Age* of September 28, 1946, page 538, mem-

bers of the Brotherhood of Railroad Trainmen walked out as the result of a wage dispute. Shortly after the filing of the abandonment application, which was submitted 17 days after train operations had been suspended, the applicant's capital stock was sold by the Kell estate to a group "interested in the abandonment of the line and salvaging of the property." The road is now in the hands of three receivers.

The proposed abandonment, according to the report, no doubt will cause shippers some inconvenience and possibly financial loss. "Although they will have to rearrange their methods of operation," the examiner said, "there appears to be no insurmountable obstacles to using motor trucks. The highway net within the area is favorable and there is a large number of common-carrier motor truck and bus lines serving all communities of importance."

The examiner said that the condition of the property is such that operation of trains is impossible until it is rehabilitated at substantial expense. Noting that the former stockholders were unwilling to advance the funds necessary for that purpose because the traffic outlook did not warrant it and that the present stockholders "evidently share" the same opinion, he said that efforts made by the receivers to interest others in the road have met with little success. "Even if the property were restored and despite the fact that operating deficits did not occur until 1945 and 1946," he continued, "it is questionable since operations ceased over a year ago whether there would be sufficient traffic now or in the near future to avoid operating deficits."

While he found that continued operation of the line, under the present circumstances, would impose an undue burden upon the applicant and upon interstate commerce, Examiner Nye said that "others" should be given the opportunity to purchase for continued operation the entire line or parts thereof, particularly industry tracks at stations where it is practical to connect them with the lines of other railroads. In this connection, he observed that one of the present stockholders testified that he and his associates are willing to sell the road in whole or part at its fair net salvage value and that negotiations have been carried on with other roads for the sale of all or parts of a 90-mile section.

Southern.—The Atlantic & Danville has asked the Interstate Commerce Commission to defer its action in the Finance Docket No. 16000 proceeding until the circuit court of Norfolk county, Va., has determined the extent of the Southern's obligations for redelivery and restoration of the A. & D.'s properties. The proceeding involves an application of the Southern for authority to abandon operations over these portions of the A. & D. between West Norfolk, Va., and Jeffress, approximately 140.5 miles, and between Clarksville Junction and Danville, approximately 62.7 miles. As reported in *Railway Age* of February 14, page 75, both lines have been operated by the Southern under an 1899 lease which expires July 1, 1949.

Because a controversy exists with respect to the condition in which the properties of the A. & D. must be restored by the Southern, the lessor, in order to obtain a determination of the dispute prior to the expiration of the lease, has brought court action in which it seeks a declaratory judgment as to the construction of the restitution provisions of the lease and the property rights and obligations of the parties thereunder. The A. & D. also stated that the Southern has moved to stay the court proceedings until the commission determines the time when the lessee will be authorized to discontinue its operations over the A. & D.

Southern Iowa.—Division 4 of the Interstate Commerce Commission has authorized this road to abandon that portion of its line extending from Moravia, Ia. to Albia, approximately 10.7 miles. The applicant originally sought permission to abandon a 21.6-mile section of the line from a point near Centerville through Moravia to Albia, but modified its application following the protests of shippers. In approving abandonment of the Moravia-Albia section, the commission noted that it is "roughly" paralleled by a Wabash line which connects with the S. I. at Moravia.

Southern Pacific.—Division 4 of the Interstate Commerce Commission has authorized this road to abandon a portion of a branch from a point near Hyland, Ore., to the end of the line at Wendling, 2.5 miles. The usual employee-protection conditions were imposed.

Texas & New Orleans.—Division 4 of the Interstate Commerce Commission has approved a 1941 contract between this road and the city of Dallas, Tex., under which the railroad will abandon approximately 2 miles of track in that city and acquire and operate another segment of approximately 1.3 miles. Steps to carry out the provisions of the agreement were deferred because of the war.

Abandonment of the present line will enable the city to constrct, with the aid of state and federal funds, a north-south boulevard extending through the central portion of Dallas. The railroad formerly was part of a main line extending from Houston through Dallas to Denison, but has been used principally for switching service for more than 10 years. In consideration of the conveyance to the city of the right-of-way, Dallas has agreed to construct and convey to the railroad the substitute line, which is not expected to be ready for use for several years.

FINANCIAL

Chesapeake & Ohio.—*Equipment Trust Certificates.*—This road has applied to the Interstate Commerce Commission for authority to assume liability for $4,750,000 of equipment trust certificates, the proceeds of which will be applied toward the purchase price of the following passenger equipment from the Budd Co.:

Number & Description	Estimated Unit Cost
12 coach lounge cars (with rear vestibule)	$113,211
10 coach lounge cars (with front vestibule)	117,304
3 lunch counter kitchen crew cars	137,240
3 diner-theater cars	117,671
3 Lunch counter tavern lounge cars	136,432
3 drawing room cabin dome cars	209,111
3 family coaches	119,249
3 observation dome coaches	179,011
3 lunch counter diner observation cars	145,081
3 coach baggage cars	112,340

The certificates will be dated March 15, sold on the basis of competitive bidding and would mature in 10 annual installments of $475,000, starting March 15, 1949.

Chicago, Rock Island & Pacific.—*Promissory Notes.*—Division 4 of the Interstate Commerce Commission has authorized this road to issue $1,239,360 of promissory notes to further evidence indebtedness under a conditional sales agreement. As reported in *Railway Age* of February 14, page 74, the applicant plans to acquire 4 4,000-hp. Diesel-electric passenger locomotives, at an estimated total cost of $1,652,604, from the Electro-Motive Division of the General Motors Corporation.

The notes will be dated March 1, and will mature annually, starting March 1, 1949. They will bear interest at the rate of 2.39 per cent yearly. The notes were sold to the Mercantile-Commerce Bank & Trust Co., St. Louis, Mo.

Missouri-Kansas-Texas.—*Equipment Trust Certificates.*—Division 4 of the Interstate Commerce Commission has authorized this company to assume liability for $1,620,000 of equipment trust certificates, the proceeds of which will be applied toward the purchase of 500 freight cars, estimated to cost $2,027,440, as outlined in *Railway Age* of February 7, page 71. The certificates will be dated March 1 and will mature in 30 semi-annual installments of $54,000, starting September 1. The report also approves a selling price of 98.937 with a 2½ per cent interest rate, the bid of Freeman & Co., and associates, on which basis the average annual cost will be approximately 2.67 per cent.

Missouri Pacific.—*Equipment Trust Certificates.*—This road has sold $4,330,000 of series JJ equipment trust certificates to Halsey, Stuart & Co. and associates on a bid of 99.181 for 2¼ per cent obligations. The certificates, $433,000 of

which will mature on each March 1 from 1949 to 1958, inclusive, were reoffered to the public at prices yielding from 1.45 per cent to 2.55 per cent, according to maturity.

Southern.—*Equipment Trust Certificates.* — Division 4 of the Interstate Commerce Commission has authorized this company to assume liability for $10,680,000 of series NN equipment trust certificates, the proceeds of which will be applied toward the purchase of 4,000 freight cars, estimated to cost $14,240,000, as outlined in *Railway Age* of February 7, page 71. The certificates will be dated March 15 and will mature in 20 semi-annual installments of $534,000, starting September 15. The report also approves a selling price of 99.20,699 with a 2⅛ per cent interest rate, the bid of Harriman Ripley & Co., Inc., and Lehman Brothers, on which basis the average annual cost will be approximately 2.28 per cent.

Wabash.—*Authorizes Dividends.*—The board of directors of this company have authorized the payment in full, on April 1, of the interest on the general mortgage 4 per cent income bonds, series A, and the general mortgage 4½ per cent income bonds, series B. The board also has authorized the payment, on April 22, of $4.50 a share on the preferred stock and $1 a share on the outstanding common stock, to shareholders of record on March 31.

Wisconsin Central. — *Reorganization.* — Division 4 of the Interstate Commerce Commission has postponed for 30 days from March 8 the assignment of further hearing in connection with this road's reorganization proceedings under section 77 of the Bankruptcy Act. As reported in *Railway Age* of February 7, page 72, the proceedings were reopened for further hearing for the purpose of re-examining the formula adopted for segregation of earnings among the several mortgage divisions of the debtor, and for the receipt of such other evidence as will assist in reconsideration of the plan heretofore approved. The case is Finance Docket No. 14720.

Chicago, Burlington & Quincy.—*Equipment Trust Certificates.*—This road has sold $7,230,000 of equipment trust certificates to the First Boston Corporation and associates on a bid of 99.29 for 2¼ per cent obligations. The certificates were reoffered to the public at prices yielding 1.20 per cent to 2.60 per cent, according to maturity. (See the *Railway Age* of March 6.)

Rutland.—*To Use Capital Assets.*—This road has been granted authority by the federal court to use $90,000, now in a capital assets fund, to tide it over what was described as the "present emergency." The money was obtained through the sale of scrap material and old equipment. Permission to use the fund was granted during a court hearing after W. E. Navin, trustee of the road, testified that it would possibly make the difference between the continuation and abandonment of the line.

New York Central.—*Equipment Trust Certificates.*—This company has sold $12,600,000 of equipment trust certificates to a syndicate headed by Harriman Ripley & Co. and Lehman Brothers on a bid of 99.429 for 2⅜ per cent obligations. The certificates were reoffered to the public at prices yielding from 1.45 per cent to 2.70 per cent, according to maturity. (See the *Railway Age* of March 6.)

Chicago, Milwaukee, St. Paul & Pacific.—*Dividend.*—This company has declared a dividend of $4 a share on the 5 per cent preferred A stock, payable on April 15 to stockholders of record on March 31. The two previous payments on this issue were $5 a share on January 10, 1947, and $2.50 a share on May 15, 1947.

Providence & Worcester. — *Dividend.* — This companny has declared a dividend of $2.50 a share on the common stock, payable on April 1 to stockholders of record on March 15. The previous payment was $14 a share on March 12. Four payments of $2.50 each were made in 1947.

Pennsylvania. — *Equipment Trust Certificates.*—This road has applied to the Interstate Commerce Commission for authority to assume liability for $10,995,000 of Series S equipment trust certificates, the third and last installment of an overall issue of $32,910,000. Proceeds of the entire issue are being applied toward the purchase of 27 6,000-hp. Diesel-electric passenger locomotives, 22 6,000-hp. Diesel-electric freight locomotives, 28 1,000-hp. Diesel-electric switching locomotives, 34 600 or 660-hp. Diesel-electric switching locomotives, 1,000 box cars and nine passenger cars, as outlined in *Railway Age* of February 21, page 73, and previous issues. The certificates, to be sold on the basis of competitive bidding, will be dated July 1, 1947, and will mature in 15 annual installments, starting July 1.

Missouri Pacific.—*Plan of Reorganization.*—The Interstate Commerce Commission has permitted a protective committee for holders of this road's 5¼ per cent secured serial gold bonds to intervene in the Finance Docket No. 9918 proceeding, pertaining to the reorganization of this road. As reported in *Railway Age* of January 24, page 64, the commission will hold further hearings in the case March 23 at Washington, D. C. The hearing will be for the purpose of receiving further evidence pursuant to orders entered last September by federal courts referring the plan of 1944 back to the commission, as recommended by the latter. The commission, meanwhile, this week received two proposed plans of reorganization, one having been filed by a protective committee for first mortgage bondholders of the International-Great Northern and the other by a committee representing first mortgage bondholders of the New Orleans, Texas & Mexico. Both roads are subsidiary debtors.

The I.-G.N. group told the commission that plans of reorganization for that road have been unduly delayed because of difficulties in developing a plan for the "complex structure" of the M.P., to which, it said, the I.-G.N. was attached through ownership of all its capital stock by the N.O.T. & M. Noting that the commission and courts have previously opposed proposals for exclusion of the I.-G.N. from the M.P. reorganization and for its separate reorganization, and to maintain the lien of I.-G.N. first mortgage bondholders, the committee said that it might be possible, because of the outlook for "considerable further delay" in the M.P.'s reorganization, to obtain court approval of a petition to withdraw the I.-G.N. from reorganization under section 77 of the Bankruptcy Act and place it under equity receivership. It then would be possible, according to the committee, to foreclose and eliminate the present equity interest, which, it said, was accorded no direct recognition in the latest plan submitted to the bondholders.

"The committee is cognizant of the fact that the International-Great Northern has accumulated a substantial amount of cash or equivalent items, a portion of which is in excess of the normal working requirements of the International-Great Northern and its reasonable needs for new equipment," the group said. It added that unless the commission and courts prefer to specify the amount of such excess cash which would be applied to debt retirement, the application of those funds to such purposes and the amount to be so applied could be left to the direction of the I.-G.N. management after the reorganization is completed.

The N.O.T. & M. committee said that, in view of the earnings of the property securing the first mortgage bonds, it would not be fair or equitable to force holders of those bonds to accept "against their will" other securities in exchange therefore. They said that their bonds were entitled either to be paid at maturity or that new securities be issued worth at least the principal amount of the bonds. Reduction of the redemption prices to the principal amount and accrued interest, they said, would permit the reorganized M.P. to pay off the N.O.T. & M. bonds at any time at their principal amount. If the new first mortgage bonds of the M.P. are worth the principal amount of the N.O.T. & M. bonds, the committee held, they could be sold and the proceeds applied toward the retirement of the N.O.T. & M. securities. The redemption prices of the latter bonds, they said, ranged from par to 105 per cent.

Chicago, Milwaukee, St. Paul & Pacific.—*Equipment Trust Certificates.*—This road has applied to the Interstate Commerce Commission for authority to assume liability for $2,640,000 of series BB equipment trust certificates, the proceeds of which will be applied toward the purchase of one 2,000-hp. "B" unit Diesel-electric passenger locomotive, at an estimated unit cost of $211,950, and 1,000 50-ton all-steel hopper cars, at an estimated unit cost of $3,330. The locomotive will be acquired from Fairbanks, Morse & Co., and the freight cars from the Pressed Steel Car Co. The certificates would be dated April 1, would mature in 20 semi-annual installments of $132,000, starting October 1, and would be sold on the basis of competitive bidding.

New York Central.—*Acquisition.*—This road has applied to the Interstate Commerce Commission for authority to acquire, through stock ownership, control of the Beech Creek, which it has operated under a 999-year lease since 1890. The applicant proposes to purchase 50,000 shares, at $33 per share plus accrued dividends, of the B.C.'s capital stock from H. S. Vanderbilt, successor trustee of the road, in addition to such shares as other holders may desire to sell. The road's authorized capital stock consists of 120,000 shares, par value $50 per share. The N.Y.C. said that purchase by it of the 50,000 shares will give it 42.52 per cent of the B.C.'s stock and thereby provide means for exercising control. The B.C. provides access to important coal producing territories in central Pennsylvania.

Bangor & Aroostook.—*Equipment Trust Certificates.*—This road has applied to the Interstate State Commerce Commission for authority to assume liability for $700,000 of equipment trust certificates, the proceeds of which will be applied toward the purchase of 4 1,500-hp. Diesel-electric freight locomotive "lead" units and 2 1,500-hp. Diesel-electric freight locomotive "booster" units, at a total estimated cost of $915,799. The equipment will be acquired from the Electro-Motive Division of the General Motors Corporation. The certificates, to be sold on the basis of competitive bidding, will be dated April 15 and mature in 10 annual installments of $70,000 each, starting April 15, 1949.

Dividends Declared

Akron, Canton & Youngstown — common (increased), $1.00, payable April 1 to holders of record March 15; 5% preferred, $2.50, semi-annually, payable April 1 to holders of record March 15; 5% preferred, $2.50, semi-annually, payable October 1 to holders of record September 15.

Dayton & Michigan. — common, 87½¢, semi-annually; 8% preferred, $1.00, quarterly, both payable April 6 to holders of record March 15.

European & North American. — $2.50, semi-annually, payable April 3 to holders of record March 12.

Gary. — irregular, 60¢, payable March 1 to holders of record February 18.

New London Northern. — $1.75, quarterly, payable April 1 to holders of record March 15.

St. Louis Southwestern. — 5% preferred (resumed), $5.00, payable March 22 to holders of record March 15.

Southern. — M. & O. Stock Trust, $2.00, semi-annually, payable April 1 to holders of record March 15.

Chicago, Milwaukee, St. Paul & Pacific.—v.t.c. for series A pfd. (irreg.), $4.00, payable April 15 to holders of record March 31.

Mahoning Coal.—$12.50, payable April 1 to holders of record March 22.

Norwich & Worcester. — 8% preferred, $2.00, quarterly, payable April 1 to holders of record March 15.

Pennsylvania.—irregular, 50¢, payable April 15 to holders of record March 20.

Providence & Worcester.—$2.50, payable April 1 to holders of record March 15.

Savannah & Atlanta.—5% preferred, $1.25, quarterly, payable April 1 to holders of record March 10.

Texas & Pacific.—$1.00, payable March 31 to holders of record March 24.

Average Prices Stocks and Bonds

	Mar. 16	Last week	Last year
Average price of 20 representative railway stocks	46.31	46.71	48.85
Average price of 20 representative railway bonds	85.66	86.15	91.05

RAILWAY OFFICERS

EXECUTIVE

A. D. Dugan, whose appointment as assistant vice-president, operations and maintenance, of the New York Central at New York was reported in *Railway Age* of January 3, was born at Springfield, Ohio, on August 10, 1883. Mr. Dugan entered railroad service in 1901 in the engineering department of the New York Central, transferring to the maintenance of way department two years later and to the transportation department in 1905. From 1912 to 1918 Mr. Dugan worked in the office of the vice-president, operating department, N.Y.C., becoming executive assistant to Regional Director, Eastern Region, U. S. Railroad Administration in the latter year. He was assistant to vice-president in the operating department of the N.Y.C. from 1920 until 1931, when he was appointed assistant to executive vice-president, holding the latter position until his recent appointment as assistant vice-president, operations and maintenance.

K. P. Chinn, purchasing agent of the Southern Pacific, with headquarters at New Orleans, La., has been appointed assistant to the executive vice-president of the S. P. Lines in Texas and Louisiana, at Houston, Tex.

Brent Baxter, director of personnel research of the Chesapeake & Ohio at Cleveland, Ohio, has been appointed assistant to vice-president—personnel.

A. C. Siler, Jr., executive representative of the Texas & Pacific, with headquarters at Dallas, Tex., will become executive general agent in that city on April 1, succeeding **S. L. Wright,** whose promotion to assistant to president, at New Orleans, La., was reported in *Railway Age* of February 14.

C. W. Brecht and **L. E. Gordon** have been appointed assistants to vice-president—operation of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio. The position of supervisor of joint facility contracts has been abolished.

The offices of chairman and president of the Hudson & Manhattan have been combined and **Willliam J. Egan,** president, has been elected also chairman of the board to succeed **Edward J. Gould,** resigned. A photograph and biography of Mr. Egan were published in the *Railway Age* of January 10, page 148.

FINANCIAL, LEGAL and ACCOUNTING

Richard R. Bongartz, assistant general counsel of the Pennsylvania, with headquarters at Philadelphia, Pa., has been appointed general attorney of the Long Island, with headquarters at Jamaica, N. Y.

B. D. Martin, director of personnel statistics of the Chesapeake & Ohio at Huntington, W. Va., has been appointed auditor of disbursements in the accounting department, with the same headquarters.

Charles Cook Howell, senior partner in the law firm of Howell, McCarthy, Lane & Howell, Jacksonville, Fla., has been appointed senior general solicitor of the Atlantic Coast Line, with headquarters at Wilmington, N. C.

F. M. Tewksbury has been appointed assistant auditor of passenger and station accounts of the Illinois Central, with headquarters at Chicago.

Stanley R. Beggs, auditor of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., has joined the Veterans Administration as special assistant to Carl R. Gray, Jr., administrator of veterans affairs and former vice-president of the Chicago & North Western.

F. H. Millard, controller of the St. Louis Southwestern, has been appointed vice-president-controller, with headquarters as before at St. Paul, Mo.

OPERATING

N. L. Dunning, formerly trainmaster of the Louisville & Nashville's terminals at Nashville, Tenn., has been appointed assistant superintendent of terminals at that point.

J. D. Morris, superintendent of the Panhandle division of the Pennsylvania at Pittsburgh, Pa., has been transferred to the Pittsburgh division, with the same headquarters, succeeding **David E. Smucker,** whose appointment as general man-

News Department continued on the next left-hand page

there is a place...



We firmly believe that for a long, long time, there will continue to be a demand for steam locomotives.

Therefore, while we *are* building diesel-electrics for the switching field — and while we *have* the highest hopes for the free-piston gas generator turbine which we are now testing for locomotive use— we will continue to build a complete line of steam locomotives.

We will continue to explore all possible ways of improving such locomotives. We will continue to build them with the traditional fineness of design and manufacture that is responsible for Lima's world-wide reputation. And we will continue to believe that there is a place for these locomotives —for such modern power as the 2-6-6-6's we are now building, as our fifth order for the C&O.

LIMA HAMILTON CORPORATION

DIVISIONS: *Lima, Ohio* — Lima Locomotive Works Division; Lima Shovel and Crane Division. *Hamilton, Ohio* — Hooven, Owens, Rentschler Co.; Niles Tool Works Co.

PRINCIPAL PRODUCTS: Locomotives; Cranes and shovels; Niles heavy machine tools; Hamilton diesel and steam engines; Hamilton heavy metal stamping presses; Hamilton-Kruse automatic can-making machinery; Special heavy machinery; Heavy iron castings; Weldments.

ager of the Long Island at Jamaica, N. Y., was reported in the *Railway Age* of March 6. **E. P. Adams,** superintendent of the Wilkes-Barre division at Sunbury, Pa., has been transferred to the Renovo division at Erie, Pa., succeeding **B. W. Tyler, Jr.,** who has been transferred to the Panhandle division succeeding Mr. Morris. **Maurice H. Lingenfelter,** master mechanic on the Philadelphia division, has been promoted to superintendent of the Wilkes-Barre division at Sunbury, succeeding Mr. Adams.

W. S. Hunter has been appointed acting superintendent of the Chicago Great Western's Iowa division, with headquarters at Des Moines, Iowa, succeeding **C. J. Foster,** who will retire on March 15, after 35 years of service with the company.

C. S. Sanderson, assistant chief engineer of the Atlantic Coast Line, has been appointed assistant general manager, assigned to special duties, with headquarters as before at Wilmington, N. C.

A. R. Nice, Jr., assistant division superintendent of the Reading at Reading, Pa., has been appointed acting superintendent of the Philadelphia division at Philadelphia, Pa., succeeding **G. F. Van Luvanee,** who has been granted a leave of absence.

W. Clifford Laraway has been appointed safety agent of the Delaware & Hudson at Albany, N. Y., succeeding **Harry G. Stevens,** deceased.

Paul M. Wolfe has been appointed superintendent passenger transportation of the New York Central system, lines West of Buffalo, with headquarters at Cleveland, Ohio.

Harry F. Donnelly has been appointed superintendent of the Providence division of the New York, New Haven & Hartford at Providence, R. I., succeeding **William E. Mullins,** who has been appointed general assistant, operating department, with headquarters at Boston, Mass.

D. W. Emms, chief clerk to general superintendent of the Canadian National, has been appointed trainmaster, Hornepayne division, with headquarters at Nakina, Ont.

TRAFFIC

The Union Pacific has appointed the following foreign freight representatives: **J. W. McComick,** Los Angeles, Cal.; **C. W. Burton** San Pedro, Cal.; **S. M. Hoffeditz,** Seattle, Wash.; and **J. G. Johnson,** Portland, Ore.

W. L. Aldrich has been appointed assistant manager of mail, baggage and express traffic of the Chesapeake & Ohio, with headquarters at Detroit, Mich.

William G. Mullens, general agent of the St. Louis-San Francisco, at Joplin, Mo., has been transferred to Springfield, Mo., succeeding **Fred J. Wilson,** whose transfer to St. Louis, Mo., was reported in *Railway Age* of January 17. Mr. Mullens is succeeded by **James W. Wasson,** agent at Paola, Kan. **Donald B. Sudsberry** has been appointed general agent at Pittsburg, Kan., succeeding **William G. Wolfe,** retired.

H. F. Kinstler has been appointed general agent of the Norfolk & Western, with headquarters at Minneapolis, Minn.

W. E. Perron has been appointed general agent of the Duluth, South Shore & Atlantic, with headquarters at Duluth, Minn., succeeding the late **V. L. Miller.**

George A. Dansberry has been appointed district freight and passenger agent of the Southern, with headquarters at Kingsport, Tenn.

R. K. McDonald, assistant general freight and passenger agent of the Missouri-Kansas-Texas of Texas, at Fort Worth, Tex., has been promoted to general freight and passenger agent at that point, succeeding **H. W. Landman,** who has been relieved at his own request and appointed special representative at Fort Worth. The position formerly held by Mr. McDonald has been abolished.

Ervin E. Swanson, traveling passenger agent of the Union Pacific, at Milwaukee, Wis., has been appointed district passenger agent at Detroit, Mich., succeeding **Ernest E. Swanson,** whose appointment as general agent, passenger department, at Kansas City, Mo., was reported in *Railway Age* of February 21.

J. H. Langston, general agent of the New York, Ontario & Western at Buffalo, N. Y., has been promoted to Western traffic manager, with headquarters at Chicago, succeeding **L. V. Cooper,** who has been transferred at his own request to San Francisco, Cal., as general Western freight agent, to succeed **J. L. Carr,** resigned. **R. C. Oldham** has been appointed general agent at Buffalo, succeeding Mr. Langston.

C. A. Spaninger, assistant agent of the Southern Freight Tariff Bureau, has been appointed agent of that bureau, with headquarters as before at Atlanta, Ga., succeeding **R. H. Hoke,** who has been appointed a member of the Standing Rate Committee of the Southern Freight Association. Mr. Hoke succeeds **S. B. Mitchell,** retired. **F. S. Higdon,** has been appointed assistant agent, succeeding Mr. Spaninger.

A. C. Bintz, commercial agent of the Burlington Lines, with headquarters at Detroit, Mich., has been appointed general agent, freight department, at St. Louis, Mo., succeding *J. V. Maxwell,* whose appointment as assistant freight traffic manager of the Fort Worth & Denver City (part of the Burlington), at Houston, Tex., was reported in *Railway Age* of March 6.

O. S. Toler has been appointed trainmaster of the Birmingham district of the Atlantic Coast Line at Manchester, Ga.

J. R. Sheppard, traveling freight agent of the Texas & Pacific, with headquarters at Dallas, Texas, has been appointed general agent at Alexandria, La., succeeding **J. W. Maxwell,** who has resigned to enter government work.

A. D. Martin, passenger traffic manager of the Chicago, Rock Island & Pacific, has been promoted to the newly-created position of general passenger traffic manager, with headquarters before at Chicago. A photograph of Mr. Martin and a sketch of his career appeared in *Railway Age* of February 7, in connection with his appointment to the position of passenger traffic manager of the reorganized Rock Island. **I. C. Bruce,** assistant passenger traffic manager, has been advanced to assistant general passenger traffic manager, also a newly created post. **R. -. King,** assistant general passenger agent in Chicago, has been advanced to general passenger agent there.

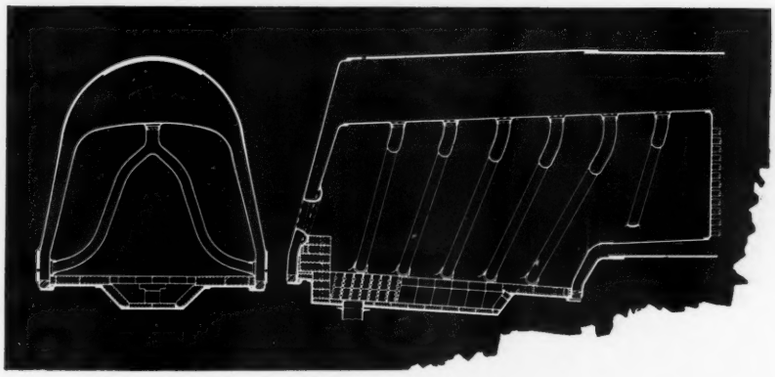
Clifford H. McNab, traveling agent of the Jersey Central Lines, with headquarters at St. Louis, Mo., has been appointed general agent at Boston, Mass., in charge of the New England area, succeeding **Harold W. Grochy,** who has been transferred to the Albany, N. Y., office.

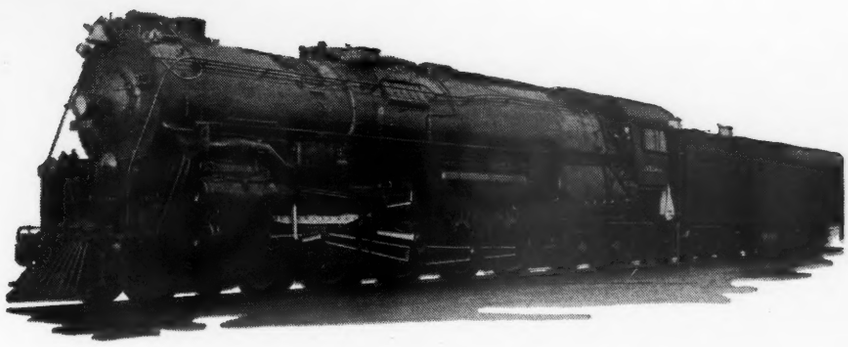
Gerald Hiam, assistant freight traffic manager of the Eastern lines of the Canadian Pacific at Montreal, has been appointed freight traffic manager in charge of sales and service, having supervision over the solicitation and handling of freight. Due to a typographical error, Mr. Hiam's new title was omitted in a previous announcement of his appointment in *Railway Age* of March 6, page 83.

Claude W. Getty, general passenger agent of the Pennsylvania at Philadelphia, Pa., has been promoted to assistant passenger traffic manager, with the same headquarters. **Richard H. Clare,** general passenger agent at Washington, D. C., has been transferred to Philadelphia. **John B. Dorrance, Jr.,** assistant general passenger agent at New York, succeeds Mr. Clare at Washington. **William P. Eckfeldt,** assistant general passenger agent at Philadelphia, has been transferred to a similar position on the Long Island at New York, succeeding **George H. Brown, Jr.,** who succeeds Mr. Dorrance. **R. F. Hampel,** division passenger agent at Pittsburgh, Pa., succeeds Mr. Eckfeldt as assistant general passenger agent at Philadelphia. **R. M.**

News Department continued on the next left-hand page

Giving 4-8-4 Oil Burners the advantages of Security Circulators





In the modernization of many oil-burning locomotives, they are being equipped with Security Circulators. The arrangement of circulators shown in the sketch — five in the firebox and one in the combustion chamber — is designed expressly for a class of 4-8-4 oil-burners.

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SECURITY CIRCULATOR DIVISION

Harvey, division passenger agent at Indianapolis, Ind., has been transferred to Pittsburgh, succeeding Mr. Hampel. **M. B. Winn,** New England passenger agent at Boston, Mass., succeeds Mr. Harvey at Indianapolis. **W. K. Chapman,** district freight agent at San Francisco, Cal., has been advanced to division freight agent at Washington, succeeding **J. A. Armento,** recently transferred to Cincinnati, Ohio.

MECHANICAL

M. J. Mills, general car inspector of the Chesapeake & Ohio, with headquarters at Wyoming, Mich., has been appointed assistant superintendent of car department, with headquarters at Grand Rapids, Mich.

Jesse P. Walker, formerly general foreman of the Louisville & Nashville, with headquarters at Sibert, Ky., has been appointed assistant master mechanic, at Boyles, Ala., a newly-created position.

E. H. Talbert, traveling fireman of the Chesapeake & Ohio, has been appointed chief motive power inspector, with headquarters at Hinton, W. Va., succeeding **A. H. Glass,** whose promotion to fuel supervisor was reported in *Railway Age* of February 21, page 78.

PURCHASES and STORES

E. V. Purdy, assistant to purchasing agent of the Southern Pacific, with headquarters at New Orleans, La., has been promoted to purchasing agent at that point, succeeding **K. P. Chinn,** appointed assistant to executive vice-president at Houston, Tex. **James R. Cade,** tie and timber agent at New Orleans, has been promoted to assistant purchasing agent there and **Robert W. Shaw,** fuel oil purchasing agent at Houston, has been appointed to the newly created post of assistant purchasing agent in that city.

A. W. Westerhaus, office manager in the purchasing department of the Southern Pacific lines in Texas and Louisiana, at New Orleans, La., has been appointed assistant to purchasing agent there.

ENGINEERING and SIGNALING

Max Nearing, assistant division engineer of the New York Central, at Cleveland, Ohio, has been appointed assistant engineer in the district engineer's office at that point. Mr. Nearing is succeeded by **C. C. Herrick,** assistant engineer in the division engineer's office at Chicago.

K. E. Stephenson, track supervisor of the Chesapeake & Ohio, at Huntington, W. Va., has been appointed assistant division engineer at Ashland, Ky. **J. H. Barksdale,** track supervisor at St. Albans, W. Va., has been appointed assistant engineer, with headquarters at Covington, Ky.

J. F. Pinson, assistant engineer in the office of the assistant chief engineer of the Chicago, Milwaukee, St. Paul & Pacific, at Seattle, Wash., has retired after nearly 46 years of service with the railroad.

Herbert G. Dennis, division engineer of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Iowa, has been promoted to district maintenance engineer, with headquarters at Kansas City, Mo., succeeding **C. B. Murray,** who has been transferred to Pratt, Kan. Mr. Dennis is succeeded by **Raymond M. Bristow,** assistant engineer on the Des Moines division.

George F. Drummond, assistant architect of the Canadian National system, has been appointed chief architect, with headquarters as before at Montreal, Que., succeeding **John Schofield,** who has retired under the pension plan of the company. Mr. Drummond was born at Glasgow, Scotland, in September, 1891, and served a number of years in private practice before joining the Canadian National in October, 1927, as assistant architect at Montreal. Since that time he has been associated with all the major building projects of the system, including stations, hotels and passenger



George F. Drummond

car equipment. Mr. Drummond received his architectural training in the United Kingdom, and is a graduate of the Royal Technical College and Glasgow School of Art. After going to Canada he became well known for his work in designing commercial buildings, particularly bank structures, and larger types of residences.

Mr. Schofield has been associated with planning and building projects in the transportation field for more than 40 years. During the war he served as construction controller in the Department of Munitions and Supply at Ottawa, Ont., and undertook special duties for the Department of Transport, the British Ministry of Aircraft Production and the Royal Air Force Ferry Command. Mr. Schofield planned and directed the construction of buildings for the Pacific communications system in the northwest, and defense communication in eastern Canada. He was consultant on decoration of the train used during the



John Schofield

visit of the royal family to Canada and the United States in 1939. On the formation of Trans-Canada Air Lines in 1937, he was also named architect for that organization. Mr. Schofield had charge of the architectural work in the Montreal Terminal Development, including the International Aviation building for which a contract was awarded recently.

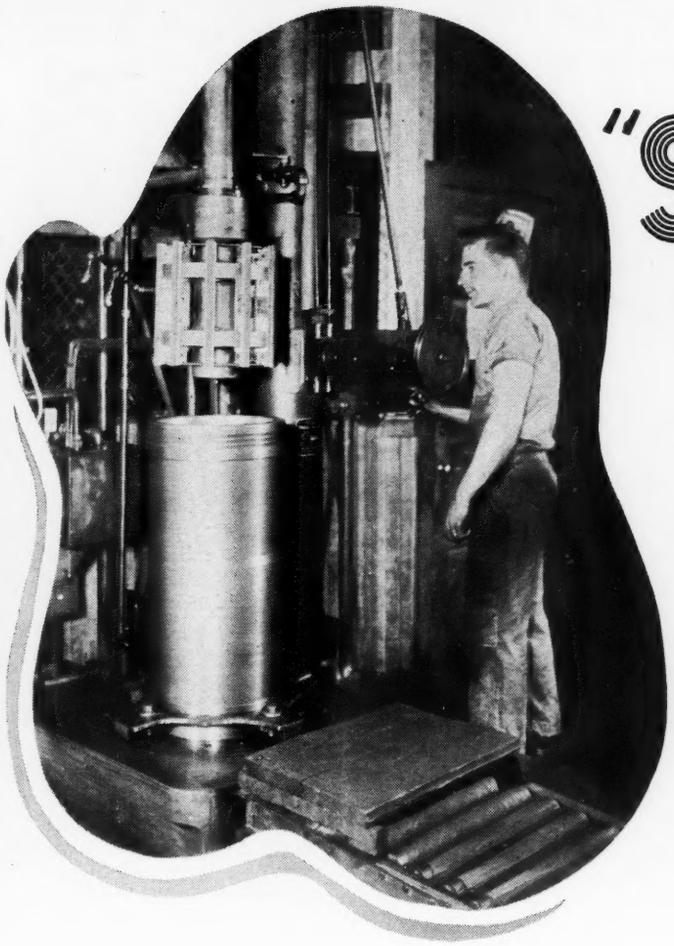
SPECIAL

E. C. Poole, engineer of the Southern Pacific's bureau of transportation research, with headquarters at San Francisco, Cal., has been appointed manager of the bureau, succeeding **C. E. Day,** who has retired. Mr. Poole is succeeded as engineer of the bureau by **G. G. Wills,** assistant engineer.

OBITUARY

Louis M. Dunn, assistant traffic manager of the Elgin, Joliet & Eastern, at Chicago, whose death was reported in *Railway Age* of February 21, was born on August 7, 1885, at Peoria, Ill., and entered railroad service with the E. J. & E. in 1906, at Plainfield, Ill. He became traveling tariff inspector at Chicago in 1912, and was later promoted to traveling freight agent. Mr. Dunn was further advanced to general agent in 1926, assistant general freight agent in 1938 and general freight agent in 1944. In August, 1947, he became assistant traffic manager, which post he held at the time of his death.

F. S. Hewes, office engineer of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, died at a hospital in that city on March 3, following a short illness.



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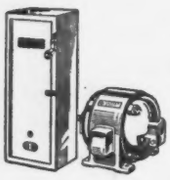
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Reports on Accidents

(*Continued from page 95*)

occurring between two ties at a point 11 ft. 6¼ in. south of the receiving end. The other breaks followed along the next 17 ft. 4⅞ in. of the rail. At all six breaks there were transverse fissures which covered from 5 to 80 per cent (at break No. 1) of the cross-sectional area of the head of the rail, but none of the fissures extended to the surface of the rail.

"The failure of the rail at the first and second breaks occurred when the wheels of the front truck of the engine passed over it, then the other breaks occurred, and the broken pieces became displaced," the report said. It added that the track in the vicinity was last inspected four days prior to the day of the accident; and that the track supervisor passed over the rail in a motor car five hours before the derailment—but "no defective condition was observed."

Great Northern Collision—The accident caused by "failure properly to control the speed of the following train in accordance with signal indications" was a rear-end collision between a mixed train and a freight train, which occurred January 13 on the Great Northern near Walden, N. D. It resulted in the death of one passenger and the injury of one passenger, one railway mail clerk and two train-service employees.

The scene of the collision, 1,017 ft. east of the station at Walden, is on the main line of the G.N.'s Minot division, which extends from New Rockford, N. D., to Fargo Junction—123.25 miles of single-track over which trains are operated by timetable, train orders and an automatic block signal system. The trains involved were both eastbound, and the main track is tangent throughout a distance of 5.5 miles immediately west of the point of accident and a "considerable distance" eastward.

Automatic signals 305.2, 303.0 and 301.8, governing eastbound movements, are, respectively, 3.87 mi., 1.83 mi. and 3,524 ft. west of the point of accident. These signals are of the three-indication, color-light type, and are approach lighted. The controlling circuits are so arranged that, when an eastbound train is occupying the main train in the block immediately east of signal 303.0, this signal displays stop-then-proceed-at-restricted-speed, and signal 305.2 displays proceed-prepared-to-stop-at-next-signal.

When an eastbound train is occupying the main track in the block immediately east of signal 301.8, this signal displays stop-then-proceed-at-restricted-speed and signal 303.0 displays proceed-prepared-to-stop-at-next-signal.

The mixed train was No. 200 consisting of a locomotive, 20 freight cars, one express-mail car and one coach, in the order named; it was a second-class train. It had stopped about 8:15 p.m. on the main track at Walden, with the rear end standing 1,017 ft. east of the station. About five minutes later the rear end was struck by First 402, a third-class freight train consisting of a

locomotive, 72 cars and a caboose. The freight had departed from Hannaford, N. D., 25.5 mi. west of Walden, at 7:40 p.m., 2 hrs. 42 min. late, and, as the report put it, "passed signals 305.2 and 303.0 which displayed proceed-prepared-to-stop-at-next-signal," and "passed signal 301.8, which was dark because of a defective light bulb." Its estimated speed at the time of the collision was 30 m.p.h., its limit being 50 m.p.h. The weather was clear.

Flag Protection—The locomotive of the freight train stopped 683 ft. east of the point of accident, the engine truck hav-become derailed and the front end "badly damaged." The rear nine cars of the mixed train were derailed; and the rear car (the coach) and the third car from the rear (a freight car) were "demolished." The other derailed cars were "badly damaged," and the front portion of this train "was forced forward a considerable distance." At the time its engine had been moved to an auxiliary track to perform switching.

The commission's investigation disclosed that when the mixed train was preparing to stop at Walden its flagman dropped a lighted 10-min. fusee from the rear car at a point about 3,300 ft. west of the point where the collision occurred. Just before the train stopped, the flagman dismounted and proceed westward to provide protection against following trains. He had reached a point about 2,000 ft. to the rear of his train when he saw the reflection of the freight's headlight; and he gave stop signals with a lighted red fusee until the engine passed him. Meanwhile, the conductor of the mixed train was in its coach; and, when he observed the freight "closely approaching," he "called a warning to the passengers in the coach, then jumped before the collision occurred."

The engineer of the freight said that when his engine was in the immediate vicinity of signal 305.2, he made a brake-pipe reduction which he thought would meet that signal's "approach" requirement. Soon afterwood, he thought his train had not responded; so he said that he moved the brake valve to emergency position, and that the brakes did not seem to function. "However," as the report put it, "he did not so inform the other employees on the engine"; and the front brakeman and fireman "did not observe that the engineer took any action to control the speed of the train in the vicinity of either signal 305.2 or 303.0, which also displayed approach." They said further that when the engine was in the vicinity of signal 301.8, they informed the engineer that no aspect was displayed by the signal. Also, they claimed to have warned the engineer that they had seen the lighted red fusee set out by the preceding train's flagman and the lighted red marker lamps of that train; but they did not observe what action was then taken, for they soon jumped from the engine.

The employees on the engine "understood that the absence of a light or a

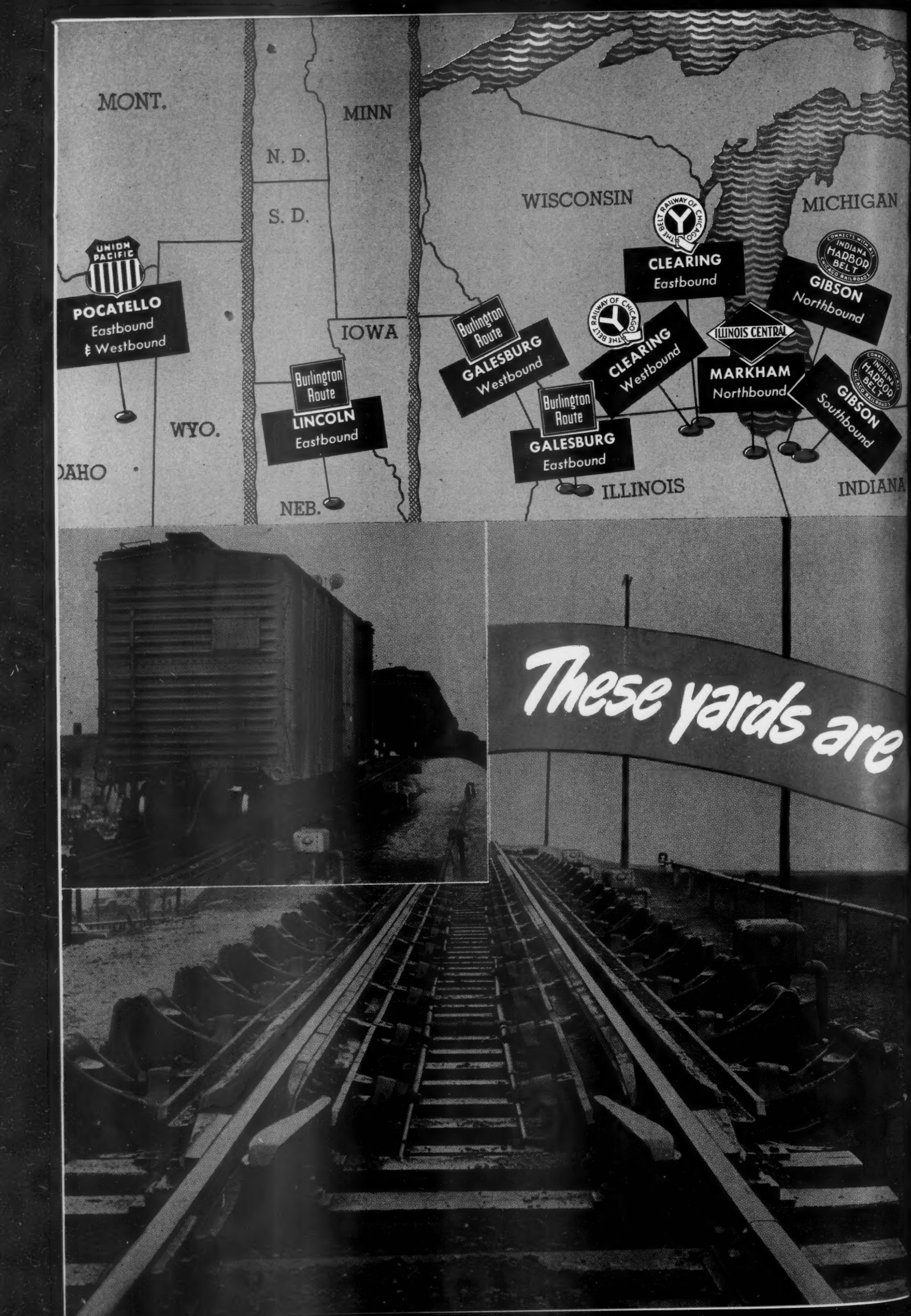
(*Continued on page* 116)



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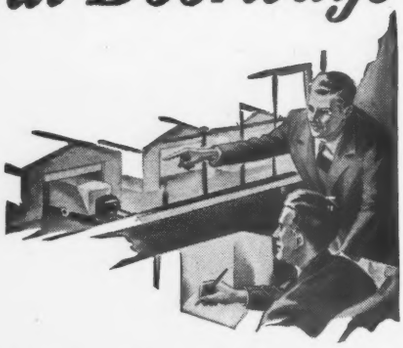
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(*Continued from page* 113)

signal at a place where a signal is usually shown or an imperfectly displayed signal must be regarded as the most restrictive indication that can be displayed by that signal," the report said. It went on to note that members of the freight's train crew had stated that the speed of the train had been controlled at several points en route by service brake-pipe reductions, "and the brakes functioned properly." Moreover, the swing brakeman reported that he had examined the brakes of each car after the collision, and "all brake shoes were tight against the wheels."

Head-on Collision—The accident caused by "failure of the superior train to obey a wait order" was a head-end collision between a passenger train and a freight train, which occurred January 15 on the Chicago, Rock Island & Pacific near Pulaski, Ark., on the Memphis-Tucumcari main line. It was in territory where no block system is in use, and the commission's report closed with a recommendation that the Rock Island establish an "adequate clock system" on the line. The collision resulted in the death of one passenger and one train-service employee, and the injury of six passengers, two railway mail clerks, two Pullman employees, two dining-car employees, and five train-service employees."

There is no station at Pulaski, which is 8.8 mi. west of Little Rock; but a siding 5,032 ft. in length parallels the main track there on the north. The accident occurred on the main track at a point 1,087 ft. west of the west siding-switch on a 4 deg. 22 min. curve. The line is that part of the Rock Island's Arkansas division which extends between Little Rock and Booneville Yard —119.2 mi., the line in the vicinity of the point of accident being single track over which trains are operated by time-table and train orders.

The passenger train was westbound No. 111, a first-class train consisting of a locomotive and seven cars of all-steel construction—one baggage car, one mail car, two coaches, one dining car and two sleeping cars, in the order named. The freight was eastbound No. 994, a second-class train consisting of a locomotive, 62 cars and a caboose. Crews of both trains had copies of Train Order No. 1, requiring that the passenger train wait at Pulaski and remain clear of the west siding-switch there until 1:50 a.m., unless the freight was into clear on the siding; and that the freight be into clear on the siding not later than 1:45 a.m., if it proceeded to Pulaski.

The passenger train passed Biddle (6.5 mi. east of Pulaski), where its crew received the train order, at 1:28 a.m., 8 min. late, and passed the west siding-switch at Pulaski, where it was supposed to wait for the freight, about 1:40 a.m., when the collision occurred. The passenger train was moving at an estimated speed of 20 m.p.h. (its limit was 45 m.p.h.), and the freight train at about 6 m.p.h. The weather was clear at the time.

The locomotives of both trains, the rear truck of the second car of the passenger train and the first four cars of the freight train were derailed. The rear end of the second car (a mail car) of the passenger train telescoped the front end of the third car (a coach) a distance of about 10 ft. The engines and derailed cars were "badly damaged," and the engineer of the passenger train was the employee killed.

Train Order Not Obeyed—The crew of the freight train received copies of the train order at Bigelow, Ark., (30.4 miles west of Pulaski) at 12:44 a.m., the train being 2 hrs. 52 min. late at the time. The commission's investigation disclosed that when the engine of this train entered the curve on which the collision occurred, its speed had been reduced to about 6 m.p.h. in preparation for entering the siding. Because of an embankment and vegetation on the inside of the curve the view of the track ahead was "materially restricted," and the first the freight's engine crew knew of anything being wrong was when they saw the reflection of the headlight of the approaching passenger train "a few hundred feet distant." An emergency brake application failed to stop the train before the collision occurred.

The surviving members of the passenger-train crew said they had understood the train order, and the front brakeman said that after the train passed Biddle he sounded on the train-communication system a waiting-point signal, which the conductor and flagman said they heard when the train was about one mi. east of the east siding-switch. They also said that the signal was acknowledged by the prescribed signal being sounded on the engine whistle; but the fireman said he did not hear either of these signals. He stated further that when the engine was in the vicinity of the east siding-switch he observed that the freight was not occupying the siding, and he called the engineer's attention to the provisions of the wait order. The engineer, according to the fireman, replied that the order established Pinnacle, Ark., 11.2 mi. west of Pulaski, as the waiting point.

"Then," the report said, "the fireman reread the order and again warned the engineer that Pulaski was the waiting point. At that time the engine was a short distance east of the west-siding switch, and the engineer made a service brake-pipe reduction. However, the train passed the switch . . . The flagman said that he was attempting to operate the emergency brake valve on the rear car when the accident occurred."

The report also stated that during the 30-day period preceding the day of the accident, the average daily movement in the territory was 9.43 trains. In leading up to its recommendation that an "adequate block system" be established there, the commission observed that if such a system had been in use "these opposing trains would not have been permitted to occupy the same block simultaneously."